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29 AUGUST 1986

USSR Report

TRANSPORTATION

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CIVIL AVIATION

ERGONOMIC CONCERNS INFLUENCING COCKPIT INSTRUMENT DESIGNS

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 5, May 86 pp 38-39

[Article by V. Smykov, first deputy chief of the GosNII GA [State Scientific Research Institute of Civil Aviation], and N. Stolyarov, senior scientific staff member and candidate of technical sciences, under rubric "Science and Technology": "Guided by Ergonomics"]

[Text] Control of a modern aircraft is a complex process of interaction between pilots and indicating and warning devices, levers and control panels. The number of these items reaches several hundred for each crewmember. Over the past 30 years, the number of indicating, warning and control devices on aircraft has tripled and quadrupled. Aviation specialists are striving to make the crew's work easier by increasing the volume of data. But this inevitably leads to increased sensing intensity, and inasmuch as the individual's ability to absorb data is limited, tangible reasons exist for missing certain operations.

Familiarity with new types of aircraft unquestionably will require another approach to control problems. Manifestation of the personal factor will be determined primarily by the quality of training for each crewmember and the adaptation of his individual potentialities and capabilities to the general principles incorporated in new designs. The human factor will be determined basically by the ergonomic nature of the layout of equipment and the quantity, shape, and even color of the indicating, warning and control devices. For this reason, it is quite obvious that the best result can be obtained only under ergonomic research conditions.

One of the results of such research is the shift to fundamentally new indicating and warning systems on chromatic cathode-ray tubes (displays) controlled by computers. In this case, it becomes possible to regulate the volume of data, as well as to conduct a dialog between the crew and the data display systems. Practically all the necessary information may be presented on four screens. The introduction of electronic systems, obviously, will lead to fundamental changes in controls. For this reason, the appearance of the cockpit in the aircraft of the future will be substantially changed.

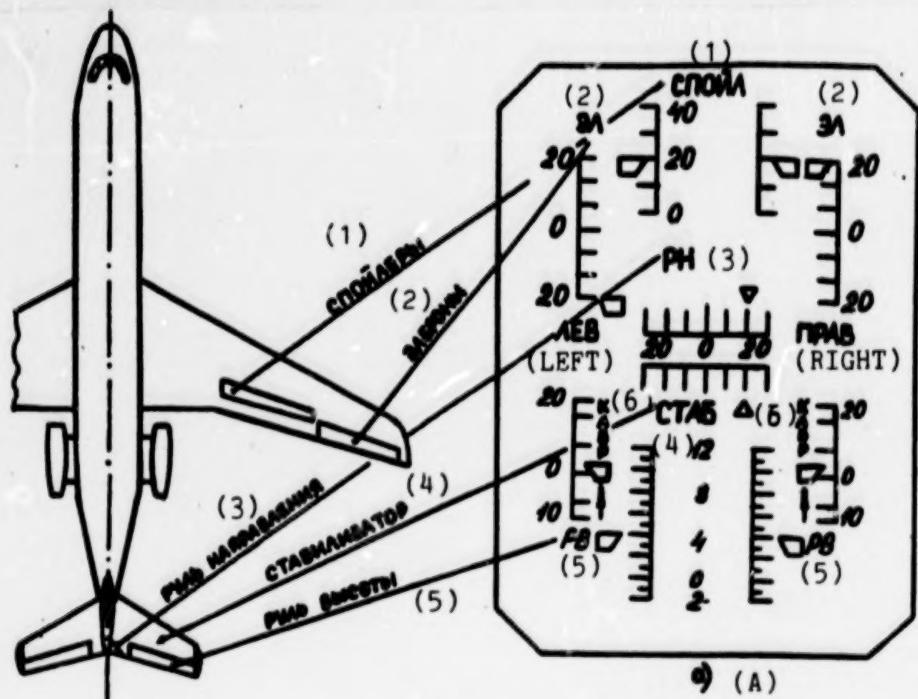
It has been proved by research that the characteristics of the operator strongly depend on his condition, on the environment, and on the changes in parameters of the objective of control. These factors have a substantial influence on personal characteristics such as delayed reaction and foresight.

It is completely natural that our institute's specialists also have been engaged in studying the behavior of the individual as operator under different conditions. Testing units and simulators have been utilized for this purpose. The crewmembers' actions and reactions were recorded on motive (motor), visual and speech channels. Biotechnical units were developed to record and evaluate their activities. Specialists from the NETs AUVD [Scientific Experimental Center for Civil Aviation Air Traffic Control Automation], the Ministry of Civil Aviation, and the RSFSR Minvuz [Ministry of Higher and Secondary Specialized Education] also took part in developing these units.

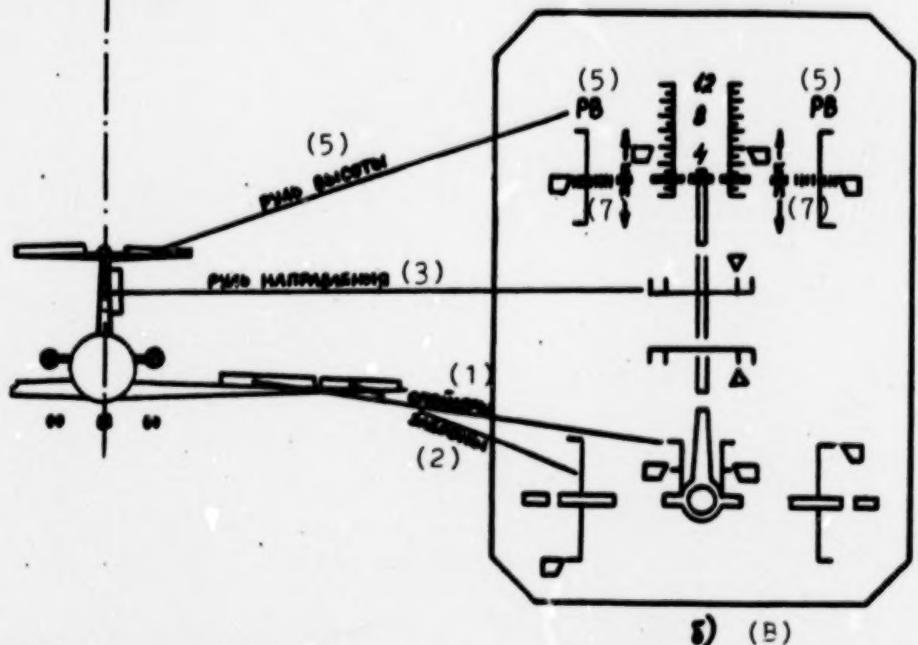
The very first experiments on the Il-86 simulator utilizing the biotechnical units made it possible to gather a large volume of statistical material and to divide the basic stable and consistent characteristics of pilots' behavior into the takeoff and landing approach stages. For example, it was established that the basic target where the "visual paths" begin and end is the flight director. The pilot's reluctance to part with it for long has the result that the most frequent "paths" are between two instruments (in 67 percent of the cases); they are significantly less frequent among three instruments (in 25 percent of the cases). The "paths" which include four or more instruments are practically nonexistent. The flight director is used for 80 percent of the overall landing time. The necessity of periodically taking the readings of other instruments into account as well forces the pilot to frequently shift his eyes up to 100-200 times a minute under normal landing approach conditions.

In many respects, the experimental materials obtained determined the subsequent course to be taken in both theoretical and practical work. In a theoretical direction, the essential and adequate conditions for a crew to absorb data to the full extent--based on the allowable time for individual instruments to "drop out" of the pilot's field of vision and the statistical time for fixing his gaze on other instruments--have been determined. At the same time, both the temporary aspects of the operator's response and the dynamic characteristics of the processes monitored by the instruments were taken into consideration.

As a result of the research, it became possible to correlate actual and theoretical characteristics and to formulate ergonomically substantiated requirements for prospective systems to depict data on displays for aircraft of the future. The procedure for evaluating the arrangement of instruments and the quality of their scales and the methods of determining the time needed to absorb warning information, developed on the basis of the theoretical data, are now working documents being utilized in different stages of practical activity. In addition, biotechnical units, together with simulators, are being used for ergonomic analysis of problems which arise in the process of aircraft operation.



4) (A)



5) (B)

Faces of combined indicators for aircraft control surfaces

A. Previous indicator

B. Modernized indicator

- Key:
- | | |
|---------------|--------------------|
| 1. Spoilers | 6. Nose-up pitch |
| 2. Ailerons | 7. Nose-down pitch |
| 3. Rudder | |
| 4. Stabilizer | |
| 5. Elevator | |

However, work in the field of ergonomics conducted at the GosNII GA is not limited to these units. In engineering and psychological research aimed at making the faces of instruments and the front parts of controls as functional as possible, information in the form of slides and equipment to record the operators' activity and condition are utilized. Such an approach has made it possible not only to formulate objective requirements for the faces of electromechanical and electronic instruments, but to devise and put into use new indicating devices developed at the institute as well. They include first of all the control surface indicators, which have substantially reduced the time for reading out data (See drawing).

The effectiveness of ergonomic research in the future may be substantially enhanced by broadening and extending the research. Thus development of the pattern and volume of information and its encoding on chromatic displays will be efficient when many variations of data depicted are examined. However, this is possible only with the availability of specially developed mathematical hardware and the application of a computer with chromatic displays.

The development of standardized documents which regulate the ergonomic requirements for equipment and the methods of determining the conformity of instrument parameters to them is extremely important. These requirements have been introduced in practice by the Ministry of Civil Aviation and the Ministry of the Aviation Industry. An "ergonomic solution" section should now be represented in all stages of aircraft equipment development, with substantiation in the form of testing materials.

In that way, calculation of the aspects of a pilot's interaction with aircraft equipment will make his working conditions easier and enhance reliability in the functioning of the "man-machine" system.

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CIVIL AVIATION

MINISTRY PLANS EDUCATIONAL CHANGES, SIBERIAN AIR SUPPORT

Moscow VOZDUSHNYY TRANSPORT in Russian 28 Jun 86 p 2

[Article under rubric "With the Course of the 27th CPSU Congress: From the MGA [Ministry of Civil Aviation] Collegium": "Intensifying Acceleration on the March"]

[Text] The concept of reorganization and acceleration of socioeconomic development is permeating all the vital activity of our sector today. The course toward practical implementation of the vital tasks set by the party is being defined more precisely. The question "On the status of air support and steps to improve it for organizations engaged in prospecting and developing the West Siberian oil and gas complex" was examined by the Ministry of Civil Aviation collegium from these positions at its meeting.

It was noted that the Tyumen and West Siberian administrations are carrying out the necessary organizational and practical measures to provide more complete and high-quality air support for sectors of the national economy in Western Siberia, the country's basic fuel and power base. Thus, air operations in Tyumen and Tomsk Oblasts increased by a factor of 1.5 in the 11th Five-Year Plan, compared with the 10th Five-Year Plan.

Because of laxity in supervision by the GUARP [Aviation Work and Transport Operations Main Administration] of the Ministry of Civil Aviation (Comrade S. I. Rodionov) and the first deputy chiefs of the Tyumen (Comrade V. N. Polyakov) and the West Siberian (Comrade Yu. I. Demin) administrations, the combination of measures to increase efficiency in using helicopters and ensure flight safety in performing air operations in the national economy have not been provided for to the full extent.

The rates of development of the material and technical base for aviation enterprises in Tyumen Oblast are not keeping pace with the rapid increase in demands from sectors of the national economy for air transportation and air support, especially in the regions where oil and gas deposits are being intensively developed--Nadym, Novyy Urengoy, Noyabrsk, Nefteyugansk and Uray.

The shiftwork flights are being conducted by the Ukrainian Administration irregularly. The quality of passenger service on these flights does not meet current requirements, which results in many complaints from the shift workers.

The Ministry of Civil Aviation collegium demanded that the chiefs of civil aviation administrations and managers of aviation enterprises consider further increasing efforts to more fully meet the requirements of oil and gas sectors of the national economy for air support and air transport, increasing efficiency in the use of aircraft and ensuring flight safety, and establishing continuous supervision over the regularity of shiftwork flights and expeditious delivery of national economic freight to the regions of Western Siberia to be the most important task in the 12th Five-Year Plan.

The CPSU Central Committee plan "Basic Directions for Reorganizing Higher and Secondary Specialized Education In the Country" was also discussed. The collegium noted that certain work to improve personnel training has been carried out by civil aviation educational institutions.

A department of higher command personnel has been created at the Academy of Civil Aviation for training higher-level supervisors; a department to improve the skills of supervisors and teaching staffs has been inaugurated at the Moscow Institute of Civil Aviation Engineers; and the training of aircraft navigation system specialists has been begun and new aircraft equipment has been acquired.

The Riga Flight and Technical School of Civil Aviation has been specialized for training controller personnel with a secondary specialized education. Beginning on 1 September 1986, a UVD [air traffic control] department will be opened at the Kirovograd Higher Flight School of Civil Aviation for training engineers in air traffic control, and a department will begin functioning at the Moscow Institute of Civil Aviation Engineers to provide additional training for command and management personnel for work in Aeroflot overseas offices.

It is planned to confer the status of institute for increasing skills on the CEMA Center of Civil Aviation in Ulyanovsk, and to establish a higher educational institution for training helicopter pilot-engineers in civil aviation on the base of the Kremenchug Flight School.

In addition, the collegium noted that the reorganization under way today in the VUZes and schools of civil aviation is not meeting the requirements of the 27th CPSU Congress to the full extent yet. Specific omissions in work to integrate production, education and science were cited.

Improvement in work to provide additional training for personnel and increase their skills is needed, for example. Insufficient attention is being devoted in training aviation specialists to be multiskilled, combining profound knowledge with thorough practical training. Production practice still has not become a reliable tool in mastering the habits of professional workmanship and the bases for organizational and educational work. Training of aviation specialists must be improved without leave from work.

Educational institutions' requirements for computer technology, for advanced equipment, and in matters of capital construction, maintenance and development of a material and technical base are not being met.

The contribution by the sector's higher educational institutions to the mission of accelerating the socioeconomic development of civil aviation does not correspond to the scientific potential concentrated in them. The material and technical support for scientific research needs to be radically improved. Most of the documents which regulate the conduct of research in VUZes have become obsolete and must be revised. The unity of scientific and training work still is not being provided for to the full extent. The training of scientific and science teacher personnel through graduate study for candidate and doctoral degrees must be improved. Student self-government, mass physical culture and defense sports work require further development and improvement.

New quality in training specialists, closely linked with radical improvement in their utilization, to guarantee that our country reaches the advanced frontiers of scientific and technical progress should be ensured as a result of reorganization. The task set is to ensure that development of higher and secondary specialized education is advancing with respect to the technical reconstruction of the national economy.

The close integration of education, science and production are the most important directions and the fundamental lever in reorganization. The main objective of the transformations noted is to sharply increase the quality of aviation specialists' training. The pivot of the reorganization under way is the shift to new principles of agreement in interaction by the higher and secondary specialized school with production and science. The development of science in VUZes is the basis for improving training of specialists and an important resource for accelerating scientific and technical progress.

Whether the discussion concerns the priority acquisition of aircraft and computer technology, advanced equipment, the construction of training facilities and dormitories, or improvement of the medical and cultural and personal services for students in the educational institutions of civil aviation, reorganization of the system of training personnel is the common concern of the sector.

With the aim of implementing the tasks which follow from the CPSU Central Committee plan "Basic directions for reorganizing higher and secondary specialized education in the country," the collegium of the Ministry of Civil Aviation planned to conduct an analysis of existing shortcomings and bottlenecks, to define ways to eliminate them, and to mobilize internal resources to improve the work of educational institutions. Attention has to be devoted principally to developing ways to improve the quality of specialists' training and the effectiveness of VUZ research, and to increasing the contribution of VUZes and schools in implementing the CPSU policy of accelerating the country's socioeconomic development.

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CIVIL AVIATION

PRODUCT TESTING, QUALITY CONTROL URGED FOR EXPERIMENTAL PLANT

Moscow VOZDUSHNYY TRANSPORT in Russian 3 Jul 86 p 2

[Article by Ye. Bolshakov, chief of a department of the "Aviaremont" All-Union Aviation Equipment Repair Industrial Association, under the rubric "Scientific and Technical Progress Dictates": "The Guarantee of Quality"]

[Text] Over the past two five-year plans our plants have been developing new ground-based equipment in accordance with technical standards specifications in which quality and reliability have unfortunately been oversimplified. But production organization at experimental plants does not meet sectorial requirements when there is actual custom production. For this reason, products being turned out today have not been subject to state certification. The criticism from operations enterprises which need highly reliable ground-based equipment is justified. But let us try to gain a little understanding of how the "iron good-for-nothings," as our newspaper has termed the products of plants which cannot be utilized in production, are acquired.

The spectrum of products turned out by civil aviation's Riga Experimental Plant No 85 covers basically the area of production process mechanization. The plant turns out about 5,000 items, more than 30 descriptions of ground-based technical equipment, annually. All this equipment should be efficient, inexpensive, and faultlessly reliable in operation.

The broad discussion which is now widespread on ways to scientific and technical progress and the criticism directed at Plant No 85 basically touch upon the problems of the quality and reliability of products being turned out, that is, the conformity of the articles of production to established specifications (TU). But after all, a great deal depends here on the quality of the specifications themselves, on the methods of checking the articles for reliability and long-term efficiency. Let us assume that an article has been excellently designed and manufactured faultlessly. That its use may be guaranteed not for 1 or 2 years, as it is now, but for 8 to 10 years, and that repair will not be required for the period indicated. Who should guarantee the article's reliable operation and what is needed for this?

All the plant's products now undergo tests stipulated by the appropriate specifications, but tests are unfortunately not conducted on their operating life. Only the functioning of individual units is tested, as a rule.

However, the conditions for such testing are insufficiently rigorous. The persons who develop them avoid comprehensive testing under extraordinarily severe conditions and with the effect of all possible factors. The reason is simple: when equipment is developed these tests are not provided for in the plans for scientific research and experimental design operations of the MGA [Ministry of Civil Aviation], and not even a testing base for ground-based equipment has been developed in a civil aviation scientific research institute or at plants.

Just who should set up a system of testing which guarantees the high reliability of absolutely all types of products in civil aviation? Who should conduct the tests of experimental, prototype and series models of the products? And finally, the most important point--who answers to whom for the quality and high reliability of the product? Most likely, the scientist is responsible to the designer, the designer is responsible to the production worker, and the production worker is responsible to the consumer. The time has come to resolve this drawn-out problem seriously at the sectorial level.

Determination of the function of new equipment customers by the scientific institutes of civil aviation seems completely incorrect to us. The institute is the primary developer, which should bear full responsibility for the level of quality and reliability of ground-based equipment.

The necessity for establishing testing complexes for all types of products of experimental plants in civil aviation is obvious. Expenditures for them will amount to approximately 8-10 percent for equipment and 4-6 percent for overall labor-intensiveness in manufacture. But these expenses will be recovered in full by reducing the high expenditures in the use and repair of the products of civil aviation plants. One more important question: evaluation of the designs of newly developed products and the decision on their acceptance for use. The problem is to ensure that not one article developed in civil aviation is inferior in its basic indicators, including its reliability, to similar models turned out by other sectors of our industry and abroad.

It is necessary to systematically update, in a planned manner, the products list of articles being produced, and to develop new types of machinery. But which ones? And who should responsibly solve the problem of developing new machinery and putting it into production? I believe that it is advisable to provide a sectorial coordinating organ in the existing structure of the GosNII GA [State Scientific Research Institute of Civil Aviation] which objectively assesses the sector's requirements for innovation and authorizes both the development of new equipment and the arrangement for its production.

This will rule out the expenditures of resources to develop products which are unjustifiably labor-intensive and inefficient.

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CIVIL AVIATION

An-28'S PROMISED FOR TAJIK ADMINISTRATION, NOT YET DELIVERED

Moscow VOZDUSHNYY TRANSPORT in Russian 8 Jul 86 p 2

[Article by K. Lolayev, deputy chief and chief engineer of the Tajik Administration of Civil Aviation, under the rubric "Here's a Problem": "Workdays Which Are Not Appropriate for a Holiday"]

[Text] Dushanbe--It seems that it wasn't long ago at all: the airport festively decorated, correspondents of central and local newspapers, the hum of movie cameras, an interview at the ramp, the happy faces of the first passengers, flowers, souvenirs... We were enthusiastically welcoming the first passenger flight by an An-28 turboprop aircraft at the Kulyab Airport.

We became accustomed to this aircraft in Tajikistan a long time ago during the course of its operational tests. For this reason, we anxiously awaited the appearance of the An-28 on air routes in the republic, hoping that the new aircraft would soon completely replace the An-2, which has served well. This event would have signified a qualitatively new stage in the development of civil aviation in our mountainous region. Everyone knows that an aircraft often is the only means of transport service in the republic, especially in the Gorno-Badakhshan Autonomous Oblast.

So the first passenger flight in the An-28 was made. It has been about 3 months since then, but the An-2 continues as before to fly the local air routes which the An-28 should be flying. All the new airplanes are standing...inoperative.

It is especially irritating that when operational testing was being conducted, all the organizations--the OKB [Experimental Design Bureau] imeni O. Antonov, the developer of the engine, the supplier and others--devoted their exclusive attention to the An-28. Interest in the creation of the famed design bureau was shown daily and hourly. This was explained by the desire to acquire an airworthiness certificate for the aircraft. Mutual contacts were reinforced by telephone calls and the continuous exchange of telegrams... A tire had to be changed, and immediate steps are taken. Is a wheel needed? It is delivered promptly. Some unit failed, and specialists fly right here in their aircraft. In a word, there was complete mutual understanding.

But then the operational testing was over. Admittedly successfully, in an organized manner, to which the high evaluation given by all sides attests. The airworthiness certificate was finally obtained. Scheduled passenger flights were begun, but unfortunately, as already stated previously, they were continued for a little over 2 months.

Naturally, we are sounding the alarm. We send telegrams to different persons: "...all An-28 aircraft are standing idle. The main reason is that engines have not been delivered. The service life of two has been exhausted. There are various defects on other engines which must be eliminated without delay." This can only be done by the supplier and the developer. But evidently this does not worry them: the airworthiness certificate was obtained, the customer accepted the aircraft, the first passenger flight was made, and beyond that it's as if it were not our concern. However, as a result, flights in the An-28 have been discontinued, the administration is suffering financial losses, the prestige of the new aircraft is declining, there are justifiable complaints from personnel, and local party and soviet organs are submitting serious claims and demanding extreme measures. Our repeated requests and calls have been unanswered. In the final analysis, everything is being reduced to mutual claims.

The basic reasons for such a state of affairs, in our view, is the fact that the production of engines and spare parts was not organized in the proper manner. As far as the supplier, developer and customer are concerned, they hold a rather passive position in this matter today. The impression is that the builders of the promising new aircraft are treating it like a stepchild. Otherwise, how do we explain the lack of proper attention to their creation? Is the OKB imeni Antonov really not interested in seeing that the An-28 wins more popularity, that the fame of the reliable, comfortable aircraft of the renowned design bureau finds even mightier wings?

A statement such as this is strange: "This is the engine. If something should not go right with the airframe..." In this regard, the position of the department where one would think they should coordinate the actions of subordinate collectives is puzzling as well. After all, this involves items of very deep concern.

I already stated above that the administration is suffering financial losses because of the downtimes for different malfunctions. As of today, they have already exceeded 70,000 rubles. The question naturally arises: who will make up for these losses? The regulations in force are extremely confusing. The time periods indicated in them enable the supplier to delay review of the complaints. The questions of mutual material liability and the application of fines have not been specified in these documents. The regulations which exist on this account were drawn up without taking into consideration the interests of aviation enterprises of the Ministry of Civil Aviation which are completely self-supporting.

Apparently it has become urgently necessary to create a special commission of the interested sides and to draft a new regulation which sets strict time periods for reviewing and responding to mutual claims.

We are well aware that every aircraft will have more than one modification over the years of its operation, that is, the aircraft will become still better, more reliable. We would like the sides concerned to do everything possible to begin eliminating all the shortcomings detected in the testing process as soon as possible. For example, it is already necessary to devote the most serious attention to reducing the noise level in the crew cabin, the passenger cabin, and in the vicinity when the engines are operating. We hope that the day will come when low-noise, so-called "whispering" propellers will be used on the An-28.

We are already concerned now about the problem of major overhaul of the An-28. The times for performing this (1989) are too protracted, and are not suitable for us by any means, since one An-28 will complete the period for its first overhaul this year.

I stress that precisely in Tajikistan, the most mountainous republic in our country, the An-28 has to become the basic aircraft on local air routes. And for this reason, providing for the operation and excellent working order of the impressive fleet of An-28's that we should begin to have and their efficient use, reliability and flight safety requires much organization of operations, proper attention to the aircraft, mutual responsibility, efficiency and quality in resolving the problems on the part of the appropriate enterprises and organizations.

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MOTOR VEHICLES AND HIGHWAYS

PLANS FOR MOTOR VEHICLE SECTOR 'DIESELIZATION'

Moscow ZA RULEM in Russian No 4, Apr 86 pp 1-2

[Article by L. Shugurov: "Dieselization"]

[Text] This word has entered our lexicon comparatively recently and has taken root very rapidly. It does not simply mean the technical re-equipping of some branch or group of branches in the national economy. A whole complex of economic and social processes stands behind dieselization. There are also savings in fuel resources, environmental protection, increased economic effectiveness in motor transport, the accompanying technical development of plants allied with the automotive industry and transport, and the growth in the technical standards of attending personnel. Dieselization is a long-term trend whose scale can be judged from the most important party and state documents.

The "Basic Directions in the Economic and Social Development of the USSR During 1986-1990 and for the Period Out to the Year 2000", which was adopted during the 27th CPSU Congress, accurately formulates the task involved in widely introducing diesel engines into automotive transport. What does their novelty consist of? It is that whereas the question mainly concerned heavy-duty trucks during the previous five-year plans, from now on dieselization will be spread to buses, light trucks and cars, that is, practically to all automotive transport. Moreover, the production scales for automobiles with these highly efficient engines have been outlined quite definitively now. They must represent 40-45 percent of the truck trains so as to bring the percentage of diesel motor vehicles in motor transport's freight turnover to 60 percent by 1990.

The magazine has written repeatedly about the sources for a diesel engine's efficiency. First of all, there is its efficiency (engine specialist scientists call it "the effective efficiency"), which is equal to 0.29-0.42 as opposed to the 0.21-0.28 of a gasoline engine. If these indicators are translated into a language closer to motorists, then, the use of a diesel engine provides for a decrease in fuel expenditures of 25-30 percent when compared with a gasoline engine. It is also necessary to keep in mind that diesel fuel costs less than gasoline.

Let us continue the comparison. It is of no small importance that there are threefold less toxic substances in the exhaust gases of a diesel engine. There

is another very serious virtue -- there is 1.5-2-fold more service life until the first overhaul. True, this is being achieved by the increased metal-intensiveness of the designs and labor-intensiveness of the fabrication, by lesser specific power and by increased requirements on operating standards. In the not too distant past, all of this restrained the production of diesel engines. However, the more difficult the extraction of oil became and the more expensive the refining of gasoline became, the clearer their main advantages moved to the forefront. Now, the need to increase sharply the percentage of diesel vehicles within the total automotive pool does not evoke any doubts -- and this means to overcome the difficulties in expanding the production of precision fuel equipment and increasing the production of diesel fuel, special lubricants and diagnostic equipment for monitoring the technical condition of engines.

In this connection it is instructive to turn to the history of Soviet diesel engines. Our specialists developed the first experimental models at the beginning of the Thirties. There were the four-cylinder, 60-horsepower NATI [State Union Tractor Scientific Research Institute]-1-60 and the six-cylinder, 90-horsepower Kodzhu. Industry, however, was still not ready for their serial production.

The first Soviet serially produced diesel engine was the two-stroke YaAZ [Yaroslavl Motor Works]-204 of 1947. After 14 years, the time had come for a second generation of engines. Whereas the designers had taken their cue from American GMC engines in building the four-cylinder YaAZ-204 and the six-cylinder YaAZ-206 engines, the prototype for the four-stroke YaMZ [Yaroslavl Engine Works]-236 and the YaMZ-238 was the NAMI [Central Scientific Research Automotive and Automotive Engine Institute]-019 experimental engine that Soviet specialists developed in 1959. MAZ [Minsk Motor Vehicle Works], KrAZ [Kremenchug Motor Vehicle Works], MoAZ [Mogilev Motor Vehicle Works], and BelAZ [Belorussian Motor Vehicle Works] vehicles are now equipped with the products of the Yaroslavl Engine Works.

During the Seventies, the KamAZ [Kama Motor Vehicle Works]-740 engine not only marked the birth of a new generation of modern designs in the plant, which had been equipped with the latest word in technology, in the city of Brezhnev (at the time -- Naberezhnyye Chelny) but it also marked the beginning of a sharp numerical increase in the production of diesel engines. Besides the KamAZ vehicles, a portion of Ural and ZIL [Motor Vehicle Works imeni Likhachev] trucks and Laz [Lvov Bus Works] buses is equipped with them. Despite the joint efforts of KamAZ and YaMZ, however, only 18 percent of the motor vehicles, which were produced by our industry in 1980, were equipped with diesel engines. This figure had risen to 28 percent by the end of last year. That is not enough today. Dieselization should not only include heavy trucks but it should also be spread primarily to the most common models -- the ZIL and the GAZ [Gorkiy Motor Vehicle Works]. Proceeding from this, the target, which was expressed in the already mentioned figures of 40-45 percent and 60 percent, was formulated in the Basic Directions.

Ways were also defined to solve it. A diesel engine works, a branch of ZIL, is being constructed in the city of Yartsevo in Smolensk Oblast. The production of vehicles in the new ZIL-4331 family (ZA RULEM, No 3, 1984) will begin at the end of the five-year plan.

New buildings are being constructed in Gorkiy for the production of the first Soviet air-cooled automotive diesel engine -- the GAZ-542 (ZA RULEM, No 3, 1986). The GAZ-6008 dump-truck trains and the GAZ-4301 trucks with an on-board platform will receive this engine in 1989. According to the estimates of economists, the capital investments in reconstructing such giants as ZIL or GAZ for the production of economical engines will be repaid in less than four years.

A diesel engine works: 6-, 8-, 10-, 12-cylinder engines with horsepowers from 120 to 240 for Ural and other trucks, which is now being built in Kustanay, will begin to manufacture a complete family of air-cooled engines in 1988 under license from (Klekner-Gumboldt-Doyts) (the FRG).

It is planned to begin the construction of a branch of UAZ [Ulyanovsk Motor Vehicle Works] -- a light truck works -- in Kirovabad during the 12th Five-Year Plan. The base model with a rated load capacity of 1.5 tons will receive a native diesel engine having 70 horsepower and 52 kilowatts. It will be suitable for installation not only in Kirovabad vehicles but also in UAZ vehicles and RAF [Riga Bus Works] microbuses.

The smallest Soviet automotive diesel engine will be the VAZ [Volga Motor Vehicle Works]-341 which was developed with the participation of NAMI specialists just as the engine for the Kirovabad one-and-a-half-ton truck. It has a two-space chamber with vertical mixing and is intended for VAZ vehicles. A modification for it consisting of turbo-supercharging is being provided. It is the first of our diesel engines for passenger cars. Stand tests of experimental VAZ-341 models have shown that its minimum specific fuel expenditure is 188 grams/horsepower per hour. The VAZ-2103, which has a reputation among motorists as one of the most economical gasoline engines, expends 225 grams/horsepower per hour, that is, 20 percent more, with an identical working volume. At the same time, the dry weight of the VAZ diesel engine is only six kilograms more than the VAZ-2103 motor. It is still early to mention time frames. The operational development and preparation of production, which takes more time for a diesel engine than for a gasoline engine, lie ahead before the beginning of production of the VAZ-341.

As we see, it is an extensive program. It includes production not only by new but also by traditional diesel engine suppliers. Thus, the new YaMZ-840 family of eight-and twelve-cylinder engines with turbo-super charging from 360 horsepower/265 kilowatts to 650 horsepower/470 kilowatts for MAZ, KrAZ and BelAZ needs to be mastered in Yaroslavl. Concerning the Kama Motor Vehicle Works diesel engine, it will receive a super-charger and its power will increase from 210 horsepower/155 kilowatts to 260 horsepower/191 kilowatts, that is, by 24 percent. This KamAZ-7403.10 modification is intended for a new family of trucks calculated at a 10-ton axle load. In connection with the eight-cylinder KamAZ-740 engine, it is necessary to mention the six-cylinder YaMZ-642

diesel engine that has with it the so-called "vertical" unification (for the crankshaft inserts, connecting rods, pistons with rings, and the parts of the camshaft). Its production has already started -- it is being placed in KAZ [Kutaisi Motor Vehicle Works]-4540 agricultural dump trucks (ZA RULEM, No 3, 1983 and No 10, 1985).

Since the dieselization of buses is planned during the current five-year plan, KamAZ will increase production of modifications of its engines for new vehicles from the Likino and Lvov works. The gain of 17,800 rubles -- calculated per one vehicle per year -- from lowering the cost of passenger service eloquently testifies to the economic benefit which the transfer of buses from gasoline to diesel engines promises.

Dieselization does not boil down to mastering the production of new engines and automobiles. The numbers, which are repeatedly cited in the press about the significant economic effect from introducing diesel engines, are based on the condition that the motor pool, which is equipped with them, is in technically good condition. This means that the other branches of the national economy must supply the needs of the automotive industry and transport for high quality (a sulphur content of no more than 0.02 percent) diesel fuel in the required amount, as well as antifreeze, special lubricants and additives, rubber items made of fluoric and silicone rubber, and instruments for inspecting and servicing the fuel equipment. Dieselization will not provide the required effect without them.

Of course, the operation of diesel vehicles requires high technical standards. Here is an eloquent example. It is sufficient for about 250 grams of dust to get into the KamAZ engine's oil system -- and it will break down. As much dust as there would be after three-four oil re-fillings from a dirty bucket lying about in the cab of the truck. Diesel engines are also very sensitive to pollution of the air arriving in the cylinders and the slightest carelessness in maintaining the fuel equipment. An inspection of KamAZ vehicles in several automotive facilities has shown that, for example, the fuel injection nozzles of the engines in only 25-30 percent of the vehicles satisfy specifications.

We often talk a great deal about the economic and ecological advantages which the use of a diesel engine in automotive transport provides. At times, we forget that this expensive engine requires irreproachable servicing. When we meet a densely smoking MAZ or Ikarus on the road, we voluntary or not cast unflattering words addressed to diesel engines in general. However, the design of the diesel engine is not at fault here -- rather it is poor filtration of the fuel, the failure to pay attention to the temperature conditions of the engine during winter, and a callous attitude toward periodic inspection of the fuel system. It should not be forgotten that practically any trouble in the fuel supply system increases smoking.

Technical and economic calculations testify that the cost of transporting freight using diesel truck trains is almost a quarter less than using gasoline

ones. In order for these estimates to become a reality, the efforts of more than the automobile builders are required. It is only possible to solve the complex task of dieselization, which has been raised in the five-year plan, through the joint efforts of many branches.

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RAIL SYSTEMS

RAILWAYS PERFORMANCE STATISTICS FOR FIRST HALF OF 1986

Moscow GUDOK in Russian 22 Jul 86 pp 1-2

[Article: "A Fast Start: A Review of the Operation of Railroads During the First Half of the Year"]

[Text] The railroads have adopted a high work tempo since the very beginning of the 12th Five-Year Plan. They completed the cargo shipment plan five days ahead of schedule during the first half of the year. The plan for freight turnover, passenger turnover, increased labor productivity and decreased shipping costs was overfulfilled; and the use of the rolling stock was improved.

Steps have been taken to raise the technical level of rail transport equipment. In order to increase the movement speed of trains and the handling capabilities of stations, work was performed to design and incorporate new technical equipment and technologies. Devices for the remote control of locomotives on heavily-loaded trains were developed and are being tested. The constant running of microprocessor systems for the automatic operation of gravity humps was begun. Tests of an automated system for controlling train movement were conducted. The shipment of goods in containers and packaging grew by 11 percent.

Rail transport has recently improved its work. Along with this, the reorganization in light of the decisions of the 27th party congress and the June 1986 CPSU Central Committee Plenum has only just begun. The work of the railroads and enterprises still has quite a few shortcomings. An efficient rhythm for the transportation conveyor line is far from being organized everywhere. Railroad workers do not operate harmoniously everywhere with the workers on the sidings of industrial enterprises and in other types of transportation. All of this leads to significant losses in loading resources and testifies to the large unused reserves. The situation with train movement safety cannot fail to evoke alarm.

Losses due to the non-safekeeping and spoilage of cargo during shipments are significant. A great deal has to be done to raise the quality of passenger services in train stations and on trains. A great deal of painstaking work is required in order to create genuine service everywhere.

What are the main indicators of the operation of rail transport during the first six months of the first year of the 12th Five-Year Plan?

More than 2,026,000,000 tons of economic goods were transported -- 118 million tons (6.2 %) more than during the same period last year and 59 million tons (3%) above the planning target.

The shipping plan was fulfilled for all cargo, except "remainders". The increase in transporting bituminous coal exceeded 11 million tons; petroleum products -- 1.9 million tons; ore -- more than six million tons; ferrous metals -- 5.3 million tons; chemical and mineral fertilizers-- 2.7 million tons; grain cargo -- 2.7 million tons, food items and agricultural products -- 3.8 million tons; and imported goods -- 5.2 million tons.

All roads, with the exception of the Western Siberian, managed their overall shipments. The collectives of the Belorussian, Southwestern, Moldavian, Azerbaijan, Central Asian, Far Eastern, and Baykal-Amur roads achieved the best results.

At the same time, eight roads did not cope with the shipment plan during June. The shipping plan for very important freight was not completely realized on a number of railroads. Thus, 1.3 million tons of timber and wood were not loaded on the Northern Railroad; 430,000 tons -- on the Sverdlovsk; 342,000 tons-- on the October; and 315,000 tons -- on the Gorkiy. A total of 650,000 tons of petroleum cargo was not loaded on the Kuybyshev Railroad; 70,000-- on the Volga; 130,000-- on the Sverdlovsk; and 100,000 -- on the West Siberian. The Gorkiy Railroad dispatched 250,000 tons of chemical and mineral fertilizers less than that planned; the Sverdlovsk -- 330,000 tons; and the Central Asian -- 90,000 tons. The Krasnoyarsk Railroad's debt for bituminous coal reached 360,000 tons.

The lagging behind the plan even for one commodity on one railroad has a negative effect on the operation of industrial enterprises and can delay the commissioning of important projects under construction. If we are to talk about the high quality of transport support for the economy, the list of transported goods must be strictly observed.

The exit routing level on the railroad network reached 44.2 percent. The increase was 0.5 percent when compared to the similar period of last year. Many more exit routes began to be used for bituminous coal, chemical and mineral fertilizers, industrial raw materials, molded materials, and wood and other cargo. At the same time the level of routing was lowered during the delivery of coke, peat, refractory material, and cement. The Baltic, Northern, Transcaucasian, Volga,Kuybyshev, and Kemerovo railroads began to

engage more poorly in routing. Routing is an important reserve for increasing the efficiency of operations. It must be completely used.

The static load grew by 700 kilograms. It increased during the delivery of the majority of bulky cargo: coal, petroleum products, ore, fertilizer, construction and timber items, and grain. At the same time, it decreased during the loading of coke, metal work, scrap ferrous metal, animal fodder, and imported and several other types of cargo. The Moscow and Transcaucasian railroads began to use the weight-carrying capacity and capacity of freight cars worse than during the corresponding period of last year. The Kuybyshev, West Kazakhstan, Transbaykal, and East Siberian railroads are not sufficiently engaged in this important matter.

Quite a few cases of additions to cargo weight and of outright fraud have been revealed. It is necessary to create everywhere conditions and a situation that would prevent the repetition of this.

According to the estimate, freight turnover reached 1.916 trillion tariff ton-kilometers. This was 66 billion (3.6%) more than the plan and 121 billion ton-kilometers (6.8%) more than during the similar period of last year. In this regard, 96.9 percent of the increase was obtained as the result of increasing shipping volumes. The capacity of freight cars, however, is still not being used sufficiently. There are quite a few cases where trains depart with empty berths, and passengers remain in the train stations because of poor information and the poor work organization of the ticket office. During the summer, people stand near the ticket offices for hours in a number of places. The average distance for delivering freight increased by two kilometers. This is in general. It grew significantly more for a number of goods, in particular, coal, peat, flux, refractory material, animal fodder, and perishable products.

Instances of the unjustified sending of freight traffic in a roundabout way have not been eliminated. This leads to unnecessary and unjustified work.

A total of 2.083 billion passengers were transported -- 75 million individuals (3.8%) more than during the same period of last year. The transportation of passengers on suburban services grew at more rapid rates -- 70.2 million individuals. The occupancy rate of a passenger car reached 32.4 individuals. This is 0.7 individuals more than last year.

Passenger turnover reached 176.8 billion passenger-kilometers. The increase was by 6.9 billion (4.1%) as opposed to the plan and 7.9 billion (4.7%) as opposed to last year.

The general average daily exchange reached 377,700 cars. This was 96.7 percent of the norm. It grew by 20,400 cars (5.4%) in comparison with the first half of last year. All railroads, except the Donetsk, achieved an increase. It increased by the largest amounts on the West Siberian, Kemerovo and Southwestern railroads. Only the Kemerovo and Baykal-Amur roads, however, fulfilled the established norm. The unhindered receipt of trains at junctions is still far from being guaranteed everywhere.

The turnover of a railroad car was speeded up by 4.8 hours as opposed to the planned figure and by 13 hours in comparison with the same period of last year. This was achieved basically by significantly reducing the demurrage under cargo operations, especially at technical stations. Here, also reserves are far from being exhausted. The experience of the collective at Beskudnikovo Station and of other foremost workers convincingly testifies to this.

The productivity of a car exceeded the given one by 6.6 percent. Last year's level was exceeded by 9.7 percent. The overwhelming majority of railroads managed their targets for using freight cars. Everywhere, except on the Gorkiy, Far Eastern and Transcaucasian railroads, it improved in comparison with the first half of last year.

The productivity of a locomotive increased by 4.9 percent. The planned target, however, was underfulfilled by 38,000 ton-kilometers gross. As a result, it was necessary to involve an additional pool of locomotives. A total of 20 railroads did not cope with the target for this indicator. The Northern, Volga, Donets, Gorkiy and Transbaykal railroads fell the furthest behind.

The non-productive use of locomotives leads not only to significant material losses but also usually to an extremely negative effect on the working conditions of the engineers and their assistants.

The average weight of a train grew by 68 tons and reached 3,093 tons. The collectives of the Tselin, North Caucasus and Southwestern are successfully coping with the increased targets for train weight. The East Siberian and Kuybyshev railroads are close to fulfilling it. Eight railroads, however, have not managed the plan. The Azerbaijan Railroad has even decreased the weight of a train when compared with the corresponding period of last year.

The majority of railroads and the network as a whole have begun to dispatch fewer trains that are not completely loaded. There are still many of them, however, on the Southeastern, Azerbaijan, Sverdlovsk, Krasnoyarsk, West Siberian and the Transcaucasian railroads.

Schedule speed increased by 1.8 kilometers per hour. The planned target was exceeded by 0.3 kilometers.

However, 14 railroads did not fulfill the total. Trains travelled even slower than last year on the Northern and Far Eastern railroads.

The passenger train movement schedule was fulfilled better than during the same period of last year: for departures -- by 1.9 percent, for travelling -- by 4.3 percent, and for arrivals -- by 8.8 percent.

The number of late passenger trains during travelling and the time of their delay decreased by almost 30,000. A total of 27 railroads achieved an improvement. At the same time, the situation worsened somewhat on the Southern, Krasnoyarsk, Transbaykal, Far Eastern, and Baykal-Amur railroads.

Even the slightest delays in passenger trains are impermissible-- and there are still very many of them. They evoke justified complaints.

A total of 75.9 percent of the freight trains travelled on schedule. This was 4.7 percent more than during the corresponding period of last year. The number of late trains decreased by 393,000. The time of their delay decreased by 1,254,000 train-hours. The freight train movement schedule on a number of railroads, however, continues to be systematically disrupted. The Gorkiy Railroad realizes it only 52.5 percent of the time, and the Kuybyshev-- 59.6 percent. This is a direct disregard for the schedule and evidence of negligent work.

Container shipments are expanding at rapid rates. During the six months, 28,017,000 tons of products were loaded in containers. The plan was exceeded by 2.7 percent and the level of the corresponding 1985 period -- by 8.8 percent. A total of 27 railroads coped with the plan. The October, Donets, West Kazakhstan, East Siberian, and Far Eastern railroads lagged behind. The average daily shipment of containers grew by 6,374 units. The shipment of freight in transport packaging was further expanded. Its volume reached 113.6 and exceeded the plan by 5.3 percent and last year's level by 12.2 percent.

The enterprises of industrial rail transport exceeded the planned shipping volume by 5.5 percent. A total of 15,311,000 tons was transported above the plan. The increase in shipping volume reached 6.6 percent when compared to the corresponding 1985 period. All associations coped with the plan. At the same time, the primary qualitative indicator -- the demurrage of cars at these enterprises -- exceeded the norm by 0.49 hours. The Kuybyshev, Armenian, Volgograd, Sverdlovsk, and a number of other associations used railroad cars unsatisfactorily.

Subways overfulfilled the plan for transporting passengers by 0.9 percent. More than 22 million passengers were transported above the plan. The Kiev, Baku and Yerevan subways, however, did not completely fulfill the quota. The labor productivity target on underground mainlines was exceeded by 3.6 percent. Transportation costs decreased by 1.4 percent.

Ministry of Railways industrial enterprises sold products worth 1,267,400,000 rubles. This was three percent more than the plan and 5.1 percent more than the level of the first half of last year. Products worth more than 36 million rubles were sold above the plan. The plants for repairing rolling stock and for producing spare parts exceeded the sales plan by 29.5 million rubles. At the same time, seven plants did not cope with the plan.

The plan for the factory repair of rolling stock was fulfilled in general. Disruptions, however, were allowed in a number of plants with respect to individual types of repairs. Ten of the 17 plants, which overhaul passenger cars, did not cope with the program including the Ordzhonikidze, Dnepropetrovsk and Ulan-Ude plants.

Five plants, including the Astrakhan, Voronezh and Moscow ones, lagged behind in overhauling electric and KR-2 diesel locomotives.

The plan for overhauling freight cars was underfulfilled by 0.8 percent through the fault of the railroads, especially the October, Sverdlovsk and Kemerovo roads. The Ministry of Railways quota for depot repairs to covered cars with an increased amount of body work was only realized by 85.7 percent.

The rail transport material and technical base was developed further. The rate of assimilating assets for capital construction during the past six months was higher than during the corresponding period of last year. The plan, however, was not fully realized. The lag reached 4.6 percent, and for construction and assembly work--1.5 percent. Ministry of Transport Construction organizations fulfilled the plan by 100.2 percent. The construction organizations of the railroads lagged behind by almost seven percent. The Transbaykal, Kemerovo and West Siberian railroads are assimilating assets especially poorly. The six-month target for commissioning housing, general educational schools, polyclinics, and hospitals has been significantly underfulfilled. This is evidence of a lack of attention toward people and toward their living conditions. (A review of the state of affairs in the construction of social projects was recently published in GUDOK).

The number of workers who are employed in shipping is decreasing. During the first six months, 55,000 fewer individuals than during the same period of last year were employed in the main activity of the railroads. The operating contingent was decreased by 47,000 individuals. On 1 July, 105,000 individuals were freed on the railroads that had shifted to the Belorussian experiment. At the same time, the technologies for the shipping process have been improved, and all branches of the economy are being technically reequipped. As a result of all of this, increased volumes in transporting freight and passengers are being mastered with fewer staff.

One cannot close one's eyes to the fact that, having reduced the staff, they -- at times -- approach people with insufficient attention in a number of places during the conducting of the experiment. This engenders justified complaints.

Labor productivity grew by 8.9 percent in comparison with the corresponding period of last year and by 2.4 percent when compared with the target. All railroads coped with the tasks and the obligations adopted for this very important economic indicator. The largest increases occurred on the Belorussian (20.2 %), Moldavian (17.1), Odessa (15.8), and Southern (13.8) railroads. At the same time, a number of railroads have lessened their attention toward this matter during recent months. Thus, four railroads did not cope with the labor productivity plan in April, and six railroads: Transcaucasian, Transbaykal, Northern, West Kazakhstan, Southeastern, and Kuybyshev, in May.

The average monthly income of workers, who are employed in shipping, increased by three percent and reached 232.3 rubles. All railroads except the

Transcaucasian, have observed a correct relationship between the rates of increase in income and those in labor productivity.

It is gratifying that we managed to decrease the hours of overtime work by 17.1 percent. Manpower idle time was decreased by 21.8 percent. The hours of overtime work on locomotive equipment were decreased sharply -- by 4.4 million; and on railroad car equipment -- by 1.7 million. At the same time, two railroads -- the Far Eastern and the Baykal-Amur -- have tolerated an increase both in overtime and in idle hours.

The strict observance of work and rest conditions is also a demonstration of concern for people. One can by no means forget this.

Shipping costs decreased by three percent. Rail transport has received 140 million rubles of above-plan profit since the beginning of the year.

The dynamic development of the country's economy requires a further intensification in shipping rates. It is important to analyze deeply, thoroughly and quickly the results of the work during the first six months at all levels and to outline ways to involve intraorganizational reserves very rapidly, incorporate the achievements of scientific and technical progress, and radically improve the technology and organization of work. A very serious psychological reorganization is required in order to raise transport work to a newer and higher level and to move to the highest frontiers in worldwide practices for all the main indicators during the present five-year plan.

Displaying creative initiative and thoroughly expanding socialist competition as the decisions of the 27th party congress and the June 1986 CPSU Central Committee Plenum require, railroad workers are filled with determination to cope successfully with the targets of the initial year of the 12th Five-Year Plan.

Based on material from the Ministry of Railways
Statistical Accounting and Bookkeeping Department

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RAIL SYSTEMS

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FUNCTIONS OF RAILWAYS MINISTRY AUDITING DEPARTMENT

Moscow ZHELEZNODORZHNYY TRANSPORT in Russian No 4, Apr 86 pp 60-61

[Article by P. P. Shmarov, chief of the Auditing Department in the Ministry of Railways: "Auditing Work in the Branch"]

[Text] The USSR Constitution requires each citizen of the USSR to safeguard and enhance socialist property and struggle against the misappropriation and wasting of state and public property. The April 1985 CPSU Central Committee Plenum and the 27th party congress pointed out the need to strengthen order and discipline, observe laws, and increase the demands on specific people for the safeguarding and correct use of all material valuables.

In rail transport, there are 9,300 enterprises, institutions and organizations that are on an independent balance. Of these, 6,600 are within the jurisdiction of railroads and the remaining ones are subordinate to the main administrations of the Ministry of Railways. A definite and, at times, significant part of public property has been entrusted to each collective. This imposes high responsibilities on the collectives for the rational and effective use of existing material, financial and labor resources.

An independent Auditing Department, which is subordinate to the minister, has been organized in the Ministry of Railways, just as in other ministries and departments, and the appropriate auditing subunits have been established in railroads, departments and subways in order to improve departmental control over the financial and economic activity of associations, enterprises, organizations, and institutions.

The functions of the Ministry of Railways auditing staff include the conducting of audits in the enterprises and organizations of the branch. The annual conducting of complete audits is provided for subunits that are on costaccounting. Planned audits of financial and economic activity should be conducted annually or twice a year in all enterprises, organizations and institutions, which are on an independent balance, and in works and facilities, which have been earmarked for a separate balance. Besides the auditing staff, specialists, who have a good knowledge of the planning and organization of production, labor and wage questions, finances, bookkeeping, etc., participate in these audits.

During audits of the production and financial activity of enterprises, organizations and institutions, their fulfillment of established plans, observance of state discipline, safekeeping of monetary assets and material valuables, the reliability of report data, and the condition of the bookkeeping are inspected. Along with this, the performing of audits is aimed at strengthening savings in the use of monetary assets and material valuables, improving state discipline, detecting and eliminating the causes and conditions that contribute to the formation of losses and shortages, and the closing of channels for the misappropriation of socialist property. Based on the results of audits, suggestions can be given on reviewing the norms in effect, valuations, prices, and tariffs as well as on changes in separate statutes, instructions and other norm acts when necessary.

The assignment of auditors to independent auditing bodies in the railroad has permitted the number of detected violations and abuses to be increased because the audits have begun to be conducted more thoroughly and not in a formal manner. The more purposeful activity of the auditing staff has permitted cases of embezzlement or shortages of material and monetary assets to be revealed and prevented. Especially large-scale embezzlements were revealed on the Caucasus Alma-Ata, Central Asian and a number of other railroads. The giving of publicity to the tolerated abuses has changed the attitude of many railroad, division and line enterprise directors toward the evaluation of control and insured a more highly principled approach to the suppression of cases of mismanagement and other illegal actions and the immediate taking of steps based on the results of the audits.

The auditing staff is paying special attention to the guilty persons reimbursing the state for the material losses caused by them. Thus, in 1985, large amounts of monetary assets and material valuables were reimbursed based upon the results. The number of people, who were held materially liable, increased almost twofold. The total of the damages, which were reimbursed by them, increased in the same amount.

However, decisive steps to eliminate every type of mismanagement, close channels of losses and embezzlements, and create in each work collective an atmosphere of impatience toward plunders of the national good have not been taken in all railroads and divisions. Thus, a large quantity of colored televisions, radio receivers, air-conditioners, musical instrument sets, and other cultural and welfare items were purchased at the Alma-Ata 1 Locomotive Depot on the Alma-Ata Railroad on instructions of the depot management without the availability of financing sources. These valuables were not counted on the enterprise's balance and their cost was written off as operating expenses. In addition, these items were given to depot workers who did not have any regard for them. Unaccounted material valuables worth many thousands of rubles were found in hidden storerooms of the depot. As a result of the revealing of these abuses, the depot officials, who were guilty of squandering state property, were dismissed from the positions they held and the material on them was transferred to investigating agencies. A certain amount of guilt here also lies on the enterprise's work collective in which an atmosphere of impatience toward plunders of socialist property has not been created.

Closer contacts have been established on the railroads with law enforcement bodies at the present time. The increase in the number of cases, which have been transferred to investigative bodies as a result of audits, testifies to this.

During the last two years, the auditing subunits of the network have fulfilled in a stable manner the planning targets for conducting audits of financial and economic activity in enterprises and organizations. At the same time, the same increase-- as on the network -- in the effectiveness of auditing work is not being observed in the administrations of the Ministry of Railways that have enterprises, organizations and institutions under their jurisdiction. This is primarily connected with the fact that the auditing staff in the Ministry of Railways administrations has still not been strengthened in the structure of its bookkeeping and financial bodies.

Based on the degree to which illegal actions have been revealed, embezzlement and shortcomings detected and steps taken as a result of audits, the effectiveness and efficiency of the auditing work of the main administrations remained at the 1983 level in 1985. It is possible that this could have been a comforting fact if it had corresponded to reality. The inspections, which were performed by the auditing department and by other monitoring bodies in the enterprises and organizations that are subordinate to the Ministry of Railways administrations, show that many violations are not discovered by the auditing staff of the main administration. Individual Ministry of Railways administrations are not fulfilling the planning targets for audits.

At the same time, shortcomings exist in the auditing work in rail transport on the whole. Individual audits are conducted superficially and do not exert the required influence on improving the operation of transport subunits. The true reasons for the failure to fulfill planning targets and obligations, for bad management, for damages and embezzlement of socialist property, for additions and distortions in reporting, and for violations of state discipline are not always established. In this regard, a just appraisal of the activity of officials and other persons, who tolerate an irresponsible attitude toward the task entrusted to them and even permit abuses, is not given. Disciplinary proceedings are not always instituted against them and they are not made materially answerable for them. The shortcomings, which are revealed by the audit, are not completely eliminated and are repeated from year to year. For example, the audit of the Pskov Division annually establishes cases of the illegal use of fuel and lubricants, especially gasoline, in the facilities of the division. The directors of the October Railroad and the branch, however, do not give the required appraisal to these cases of mismanagement, do not institute proceedings against the guilty parties and do not take steps to compensate for the losses.

It is necessary to point out that the directors of a number of railroads and main administrations in the Ministry of Railways still do not devote the required attention to the make-up of the auditing staff. At the same time, it is possible to find opportunities for completely staffing the auditing apparatus and establish higher pay rates for auditors and increments for ratings for the more qualified ones. When staffing the auditing apparatus, it is necessary to

take into consideration the nature and conditions of the auditors' work, which have their own peculiarities distinct from other transport workers.

The publicizing of the review of the audit results should be allotted a great deal of significance in the performance of preventive work and in the prevention of violations. As a rule, audit results must be submitted without fail to discussion by the work collective; and representatives of party, trade union and public organizations and the directors of higher bodies must participate in the analysis of the audit act. The results of the audit must be reported to local party and soviet bodies.

The examination of the results of complex audits of the financial and economic activity of railroads in selection meetings is a practice in the Ministry of Railways. All line subunits of the inspected railroads and the party and trade union aktiv of the railraods and divisions participate in it. As experience has shown, this form of reviewing audit results is the most effective and efficient.

The contests for the best railroad and division in organizing auditing work, which are conducted jointly by the Ministry of Railways and the railroad transport and transport construction workers trade union's central committee, serve the purposes of increasing the prestige of the auditing profession in revealing shortcomings in financial and economic activity and the illegal expenditure of resources, in insuring the safekeeping of socialist property, in strengthening in every possible way discipline in production, and in improving savings conditions. The winners of the contest are the railroads and divisions which fulfill planning quotas for the conducting of audits and inspections, achieve indemnification for the maximum losses, review audit results in a timely fashion, provide for complexity in inspections, and conduct regular training of the auditing staff on the principles and methods of auditing work.

Questions concerning the improvement of auditing work in rail transport were discussed at a network meeting conducted in Chelyabinsk. It was emphasized during the meeting that, having achieved on the whole a high level of detection of violations, the auditing staff still does not conduct sufficient preventive work to avert them. That is why the task of the auditing bodies should not today be boiled down only to the conducting of audits and inspections. It is necessary to analyze and sum up the material after their completion and also monitor the carrying out of the adopted decisions. In this connection, closer ties with all controlling bodies, especially bookkeeping ones, which exercise preliminary and current control, are required. It is also necessary to see to it that chief bookkeepers are truly state controllers in all rail transport subunits and that they fully exercise the rights that have been granted to them.

Along with discussing the burning topics of the day in the organization of auditing work in rail transport, the meeting participants suggested a number of concrete proposals for further improving it.

In their opinion, the entire staff of auditors for controlling income and expenditures should be concentrated in the established auditing subunits of the administrations and divisions of the railroads.

Practice showed that the separation of the financial auditing apparatus was not effective when reorganizing control. The combining of auditors for monitoring expenses and income will permit unified financial monitoring bodies -- auditing departments -- which will purposefully carry out this work, to be organized on all divisions. In the future, it will be possible to include auditors from other services in these departments.

Within the apparatus of the Ministry of Railways main administrations, it is necessary to improve the organization of auditing work and improve the staff of auditors in the financial and bookkeeping bodies. In order to raise the material interest of auditors, the ministry must permit the directors of the administrations and divisions to establish other indicators and conditions for awards, which are different from the indicators and conditions provided for the granting of awards to engineer and technical workers and employees in the administrations and divisions, for the workers in the auditing subunits with a consideration for the distinctive features of their work -- especially since such encouragement is permitted by the Standard Statute on Awarding Bonuses to Rail Transport Enterprise and Organization Workers for the Main Results of Economic Activity.

In our opinion, this system for awarding bonuses should be in effect, as an exception, for a definite period of time, for example, in cases of low effectiveness of control and when the staff is not at full strength. It is also necessary to legalize the payment of increments to the auditing staff for the travelling nature of its work.

The tasks of control have been clearly and accurately defined in the Basic Directions for the Economic and Social Development of the USSR During 1986-1990 and During the Period Out to the Year 2000: to improve its role in insuring the rational and economic use of resources and to intensify the struggle against mismanagement and waste and for the safeguarding of socialist property. The improvement of control and the insuring of order and discipline in all transport links will contribute to the successful fulfillment of the planning quotas in the 12th Five-Year Plan.

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RAIL SYSTEMS

OTHER RAILROADS TRY BELORUSSIAN RAILROAD ECONOMIC EXPERIMENT

Moscow GUDOK in Russian 20 Apr 86 p 2

[Interview with N. Biryukov, deputy chief of the Main Planning and Economic Administration of the Ministry of Railways, by GUDOK correspondent M. Kosolapova; date and place not specified]

[Text] The course toward all-round intensification of production and sharply increasing its efficiency requires a serious reorganization of economic operations management methods. Economic levers and incentives must work at full strength. The Belorussian experiment is aimed at this. New economic operations management conditions of the type used in industry are being tested in order to increase the efficiency of transport production on two lines. Our correspondent M. Kosolapova requested N. Biryukov, deputy chief of the Main Planning and Economic Administration of the Ministry of Railways, to answer a number of questions.

[Question] Nikolay Ivanovich, today perhaps all railway workers know about the conduct of the Belorussian Railroad economic experiment. Its results speak for themselves. Labor productivity for the year increased 11.2 percent. Wages increased 7.6 percent. Now eight more lines are working using the experience of the Belorussian Railroad. In January of this year the Dnieper and Southwestern railroads switched to the new economic operations management conditions. What is the fundamental difference between the Belorussian experiment and the reorganization being conducted on these lines? Many readers ask about this.

[Answer] The Belorussian experiment was primarily directed at speeding up considerably the rate of increase in labor productivity and effective material incentives. By using the achievements of technical progress, improving technology and organization of production and labor, and increasing personnel qualifications, an acceleration in the rate of increase in labor productivity was ensured on the railroad in the shortest possible time. Having accumulated resources, the wage rates and salaries for workers, specialists, and office workers were increased. All this was done using internal resources of the railroad, without subsidies from the budget.

Right after the eight railroads which have already begun operating by the Belorussian method, nine more will switch over to it in 1987, and the rest in 1988-1989.

The new conditions of economic operations management being introduced on the Dnieper and Southwestern railroads by no means exclude the Belorussian method. It is included as a component part in improving the economic mechanism. The reserves for increasing labor productivity and economy of the wage fund are the same as in the Belorussian experiment.

A particular feature of the operation of the Dnieper and Southwestern railroads under the new conditions of economic operations management is primarily that the responsibility of their collectives for meeting the requirements of the national economy and population for shipments of freight and passengers. They have intense plan quotas established for total volume of freight shipments and set products list. Whereas before the percentage of allotted products list was 30-60 percent of the total volume of shipments, now it has been increased to 75 percent, with a further increase in subsequent years. Thus, the railroad bears an economic responsibility for timely shipment of freight.

[Question] Does that mean that the system of concluding contracts between the client and the producer, being used in industry, is being applied to transportation?

[Answer] Taking into account the specific nature of the work of railroads, it is practically impossible to organize concluding shipment contracts between the consigner and the transport enterprises. It is difficult to picture the mechanics of concluding contracts with several hundred thousand consigners in the various regions of our huge country. In the future, when computer centers are put into operation on all railroads and their enterprises, this may be possible to do. But should it be done?

The relationships between the railroads and their clientele are regulated by the freight consignment plan with mutual obligations of the parties to ensure it is fulfilled. As for individual consignments, the existing consignment note issued for freight shipment is also a contract between the parties.

[Question] Nikolay Ivanovich, earlier a plan was considered fulfilled and a bonus ensured if the quota for total consignments, for the two most important freight designations, and for profit, cost, and labor productivity were realized. How about now?

[Answer] Under the new conditions, besides fulfilling the quota for total volume of shipment and assigned mix, the quotas must also be realized for such indicators as passenger turnover, increase in labor productivity, acceleration of railcar turn-around time, and reduction in shipping costs. Thus, the economic mechanism motivates one to increase production efficiency.

[Question] Are there any changes in the formation of funds, in particular, the wage fund?

[Answer] There are substantial changes. Before, a railroad could not use the wage fund savings. Under the new conditions, the railroad keeps the savings obtained and they are calculated in the base wage fund.

[Question] Tell us about this in more detail.

[Answer] The year 1985 became, as economists say, the base year for the 12th Five-Year Plan. By way of illustration, the reporting wage fund for workers connected with shipments was 100 million rubles for the Dnieper Railroad. Let us add to this fund the relative savings of the wage fund for this period--2 million rubles. From this amount we will subtract losses of 1 million rubles. This is made up of 50 percent of the additional payment for overtime work and the same percentage of the amount for idle time for the work force and other non-productive costs of the wage fund. The remaining 101 million rubles is the base wage fund for determining the plan for 1986.

The new conditions of economic operations management have established a wage fund standard for the Dnieper Railroad: 0.5 percent per 1 percent increase in volume of shipments. Based on the planned increase of 1.8 percent in volume of shipments in ton-kilometers, the plan wage fund for 1986 will be 102 billion rubles.

[Question] How is the influence of material incentives being increased under the new conditions?

[Answer] You know, everything becomes known by comparison. Before, the material incentive fund depended on how much the quotas for freight shipment and reduction of shipping costs were overfulfilled. For each percentage of overfulfillment of the consignment plan, as an example, the material incentive fund increased by 5 percent within the limits of the above-plan profit. Now this fund is created through deductions from the profit for each ton of freight shipped. The accepted standard is stable, is established for the 5-year plan, and is not subject to change.

If the railroad overfulfills the planned volume of freight shipments, understandably taking into account the established products list, for each additional percent the material incentive fund increases by 15 percent. If the plan is underfulfilled by 1 percent, the fund is decreased by 3 percent. Incentives are provided for reducing production costs using the same pattern. Only in this case the material incentive fund increases and also decreases by 2 percent.

The new conditions of economic operations management open up great possibilities for providing incentives for successful work. Savings in the wage fund may be used to increase supplementary payments to wage rates and salaries of highly qualified workers. Depending on the result of work, an engineer or technician may be paid a bonus of up to 50 percent of his salary. In addition, through savings in the wage fund, according to the year's results for fulfillment of the freight shipment as a whole and for a given products list, it is authorized to pay bonuses to supervisory workers of up to twice the salary, and an additional bonus of up to twice the salary for fulfillment of the remaining basic summarized indices. Thus, in addition to the

supplementary payments under existing bonus systems, a supervisor showing initiative may, according to the year's results, receive bonuses amounting to four times his salary.

[Question] Do the new conditions provide for changes in the formation of the social, cultural, and welfare fund?

[Answer] Earlier, the fund for social and cultural measures and housing construction was formed by simply taking 30 percent from the material incentive fund. Now this fund is set depending on the increase in labor productivity. If it increases by 1 percent, the fund increases by 4 percent. In the future it will become the main source for housing construction.

[Question] The railroad workers are not indifferent as to what the production development fund is like. Usually it was used for financing capital investments and, as a rule, was spent without taking into account the opinion of the manager of a railroad department, much less of a line enterprise. How do things stand now?

[Answer] Use of this fund is at the discretion of the labor collectives. Higher organizations do not have the right to remove it from the line enterprise. It is created in the appropriate proportions from the plan profit and amortization deductions intended for restoring fixed assets. It is applied towards financing the costs for re-equipment and modernization of existing enterprises, incorporating advanced production technology, and eliminating bottlenecks in production.

[Question] Nikolay Ivanovich, what does the ministry expect from the reorganization of economic operations management methods?

[Answer] From the Belorussian experience, we expect an accelerated growth in labor productivity. From the new economic mechanism being applied on the Dnieper and Southwestern railroads, we expect a stable fulfillment in shipment plans, a growth in labor productivity, and a reduction in production costs. In short, we expect high end results from each collective. Gradually these conditions of economic operations management are planned to be incorporated on all main lines. We hope that the new methods of economic operations management will be come a reliable tool for increasing production efficiency and fulfilling the crucial tasks set before the railroad workers by the 27th Party Congress.

12567
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RAIL SYSTEMS

CPSU OFFICIAL COMMENDS BELORUSSIAN RAILROAD EXPERIMENT

Moscow EKONOMICHESKAYA GAZETA in Russian No 21, May 86 p 14

[Article by V. Davydov, first deputy chief of the Transport and Communications Department of the CPSU Central Committee: "The Experiment and Its Dissemination"]

[Text] Labor productivity on railroad transport can increase considerably more quickly. The experience of the Belorussian Railroad collective convinces us of this. This article deals with the possibility and problems of disseminating the experience.

For a number of years labor productivity on railroad transport has either remained unchanged or increased insignificantly. An increase of 1.5-2 percent or even a fraction of a percent per year has been considered a good result for this index. Needless to say, such a situation cannot be tolerated under conditions of a decisive acceleration of the rates of social and economic development.

One effective way of significantly increasing the labor productivity of the transport workers is to disseminate the experience of the Belorussian Railroad workers, which earned a high appraisal in the CPSU Central Committee Political Report to the 27th Party Congress.

The Belorussian Railroad collective, shifting to a new wage system and combining duties, has managed in a short period of time to free about 12,000 people for enterprises of other sectors. During 1985 alone, labor productivity here increased by 11.2 percent. For the new conditions the task has been set to raise labor productivity by approximately one-third compared to the base year of 1983.

It is noteworthy that before introduction of the new system labor productivity for the 10th Five-Year Plan and 3 years of the 11th Five-Year Plan increased only 2.4 percent on this line. As we can see, there has been a very serious qualitative improvement made.

THE ABILITY TO MANAGE RESOURCES

What is the key to achieving such an impressive result? The guarantee of success is in the bold, innovative approach of managers, specialists, and party organizations of the enterprises and subdivisions of the Belorussian Railroad to improving the methods of economic operations management. This experience once again convincingly shows how much can be achieved by skillfully using the tremendous capacities which our socialist economy has at its disposal.

In 1984 the Belorussian Railroad workers came forth with an initiative and received support in conducting an economic experiment aimed at carrying out an increasing number shipments with fewer personnel. They were authorized to use the wage fund savings obtained for increasing the wage rates and salaries for workers, specialists, and production leaders.

It was quite natural that it was a collective of the Belorussian Railroad that came up with such a proposal. Over the course of recent years they have been purposefully and energetically introducing the achievements of scientific and technical progress here. On this basis, the production processes and the very organization of production and labor have changed substantially. As a result, favorable conditions were created for combining occupations, expanding the servicing zones, spreading brigade contracting, and improving engineering labor. This also made it possible to achieve a considerable savings in manpower resources and monetary assets.

The experience of the Belorussian Railroad workers suggests how important it is to define precisely the priorities in using allotted capital investments.

It is precisely because of this that much was done to increase the throughput and carrying capacity of high-traffic lines. Second tracks have been laid on a number of sections. The Krasno-Orsha-Minsk-Brest route has been electrified. In the past 5-year plan alone, nearly 700 kilometers were equipped with automatic blocking and centralized traffic control, and control of 2,500 switches has been automated.

Here is a typical example. Automating railroad crossings made it possible to free 1,600 duty operators on the railroad. At first glance this is simple, but it involved a large amount of work by the railroad workers together with workers of the republic's State Motor Vehicle Inspection, with the active support and assistance of local soviets of people's deputies.

The new equipment made it possible to increase the weight of trains and increase their traveling speed. Freight trains weighing up to 8,000 tons are driven. Passenger trains travel at speeds up to 160 kilometers per hour. The collective of the Belorussian Railroad has served as an example of effective use of computers and creating automated shipment management systems. Specialists from other railroads in the country are studying the incorporation of computer technology here.

EACH IS INTERESTED

A large social program aimed at improving the labor and living conditions of the railroad workers is being successfully implemented on the Belorussian Railroad. From year to year the plans for housing and social and cultural construction are overfulfilled.

It should be noted that the undertaking of the transport workers has received effective party support. The preparation for the experiment and its progress was constantly monitored by the Belorussian Communist Party Central Committee, which clearly defined the tasks of party committees, soviet organs, and public organizations of the republic in connection with the railroad's shift to working under the new method.

Above all it was necessary to explain to people the essence of the experiment and show the benefits it would promise production and each member of the collective as well. To do this, workers' meetings were conducted everywhere, and wide use was made of mass information media. The principles and details of the reorganization were discussed at classes in the system of party and Komsomol studies and economic education of workers.

In Gomel, a junction party committee set the correct tone in shifting collectives of 19 enterprises to the new labor conditions. Specialists prepared specific information material. Seminars were conducted for the party organization secretaries of enterprises and shops, party group organizers, political information specialists and agitators, and propagandists of party and economic studies. Party meetings, at which the tasks of communists were clearly defined, were well-prepared and of great benefit for the cause. The objectives of the experiment were studied in 16 schools of specific economics.

It must be said frankly that initially not all of the workers of the railroad were firmly confident that the innovations would actually lead to positive changes in the labor conditions and wages. Each person had to be convinced, proven, and motivated towards the reorganization. It was important for everyone to realize that a new attitude was needed and that success would be achieved only with more intense, qualitative, and productive labor.

The reorganization was conducted under conditions of complete publicity and strict monitoring of the implementation of workers' proposals. The experiment became the cause of each worker of the railroad. Party committees of junctions and party bureaus of enterprises carried out much organizational work. Through the communists they created in the collectives a situation of faith in the new approach and instilled confidence in success.

Party organizations and economic managers of the railroad skillfully used the truly unlimited capabilities which the labor collectives have available. By way of illustration, more than 1,500 photographs of working hours were made with the participation of public bureaus of technical norm setting. As a result, hundreds of hopelessly outdated norms were identified, the majority of them clearly too low, not taking into account the increased level of equipment and technology.

The active participation of labor collectives in the reorganization was also evident in the large number of suggestions for organizing subdivisions and reviewing output norms. Thus, the comprehensive self-supporting shift of dispatcher V.G. Nesterenko from Minsk-Tovarnyy Station reduced the number of workers by 14 percent, thereby increasing labor productivity on the shift by 27 percent. A brigade of the Gomel Signalling and Communications Division (brigade leader P. Ye. Ivanov), as a result of expanding the servicing zones and increasing the qualifications of each worker, began servicing equipment in a high quality manner with fewer personnel. They managed to increase labor productivity by 22 percent. There are many such examples.

In all, more than 40,000 output norms were increased. Fixed quotas were increased by an average of 10 percent. Regulating the norms made it possible to intensify labor and raise its quality. The labor not only of workers, but also of engineering and technical personnel became more efficient. An analysis conducted showed that about 30 percent of the engineering and technical personnel perform extraneous functions and are engaged in compiling information and reports. Now this work is done by computers.

The official duties of supervisory and engineering and technical personnel have been reviewed, and the staffs in the railroad's administration and departments have been reduced. Specialists have become more directly involved in production organization and technology and the incorporation of progressive techniques and advanced methods of labor. Today nearly 85 percent of the brigades are working on a single job authorization. About one-half of the workers of the line are part of brigades run on a self-supporting basis.

A DELICATE ISSUE

Reducing staffs is usually a painful process. This cannot be done off-hand. It requires very serious work with people so that the job placement of the workers being freed is done in an organized manner.

The most suitable work is selected for the railroad workers at the sites with great concern and participation. Attention, sensitivity, and benevolence are shown towards each worker.

"It is by no means a simple matter to decide what work can be performed by fewer personnel and where to assign those people being freed," says A.G. Andreyev, chief of the railroad. "We even try not to use the word 'reduce'."

Actually, the workers being freed are officially transferred to other sectors of the republic's economy that have a manpower shortage. As a rule, people do not lose any wages.

But what have those who remained and work more intensely gained? Compared to 1984, the wages in 1985 increased an average of 7.6 percent.

The Belorussian Railroad has also approached the very process of shifting to new wage rates and salaries creatively and in a well thought-out manner. First of all, they increased the wages for workers involved in repairing locomotives, cars, and containers, making up trains, loading and unloading

operations, and maintaining tracks, signalling and communications devices, and power supply, and also for office workers and service and building maintenance personnel. Only in the concluding phase, when the success of the experiment was evident, the new wage conditions were introduced for supervisors and engineering and technical personnel of the railroad's enterprises, departments, and administration.

The new work conditions had a positive effect on all the activities of the railroad and its departments. In 1985 more than 800,000 tons of freight were shipped over and above the plan. The quota for freight car turn-around time was fulfilled, and the detention time at freight terminals and maintenance depots was reduced considerably. Shipment costs decreased, and an above-plan profit was obtained. The railroad collective has also started 1986 off successfully. In 3 months, 1,350 tons of national economic output have been shipped over and above the plan. Labor productivity has increased by nearly 10 percent.

AFTER THE BEGINNING

Becoming familiar with the experience of the Belorussian Railroad workers convinces one not only of the possibility, but also of the need to disseminate it over the network of railroads. However, we should not labor under a delusion that the same high results will be obtained everywhere. Because of the specific conditions of certain areas, various lines have different technical equipment. One must not disregard the difference in the structure of shipments. On the Belorussian Railroad, freight operations account for 95 percent of the work, but on the Moscow Line, as an example, passenger traffic accounts for up to 40 percent. Needless to say, personnel reductions must not in any case reflect on the quality of servicing passengers and traffic safety.

The overall result must be a sharp acceleration in the rate of growth of labor productivity. This is indicated by the quarterly results of eight lines switched to the new system at the beginning of this year. Compared to the same period last year, labor productivity increased by 6.5 percent on the Alma-Ata, 15.4 percent on the Lvov, 23.3 on the Moldavian, 15.6 on the Odessa, 14.6 on the Baltic, 5.8 on the North Caucasus, 7.9 on the Central Asian, and 10.7 on the Southern railroads.

It is not difficult to notice the mixed nature of the indices. This is a result of both those reasons mentioned above and the short period (a total of 3 months), as well as different attitudes toward the new methods.

Recently the CPSU Central Committee approved of the work experience of the Belorussian Railroad's party organizations and labor collectives on accelerating the rate of growth of labor productivity. It has been proposed to the Ministry of Railways to make wide use of this experience in switching railroads to the new conditions of economic operations management.

12567
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RAIL SYSTEMS

MORE EFFECTIVE USE OF RAILROAD RADIOCOMMUNICATIONS URGED

Moscow GUDOK in Russian 1 Jun 86 p 2

[Article by N. Dotsenko, radiocommunications department head of the MPS [Ministry of Railways] Main Administration of Signals and Communications, and Yu. Vavanov, department head of data transmission at the VNIIZhT [All-Union Scientific Research Institute of Railway Transportation] in Moscow: "Radiocommunications: Untapped Resources"]

[Text] The country's demands for freight shipments and passenger hauls are continuously growing. The shortage of railcars and locomotives is constantly making itself felt, especially during the fall when the time comes for shipping grain, fruits and vegetables and the time for stocking up coal and liquid fuel for the winter. Each railcar, and all the more a locomotive, is accounted for. It would seem any possibility that promotes a reduction in the layover of rolling stock and an increase in section speed and in electrical power and fuel savings must be used under conditions like these.

Why aren't train radiocommunications being used in full measure for these purposes? In fact, with their assistance it's possible to transmit to a train engineer the orders of an assistant station master or a dispatcher for the departure of a train according to the group traffic light in a case where, let's say, the route indicator or signal repeater is defective and if the track doesn't have an exit traffic light, or the head end of the train exceeds the exit signal and it's impossible to determine its authorization aspect.

In all these and some other cases the use of radiocommunications can replace issuing to the train engineer a written authorization, for the delivery of which time is required. Using radiocommunications it's possible to save time too when it's necessary to receive a train at a station where there is an inhibit aspect of the entry signal. In this case, as well as for receiving a pusher locomotive and trains that are following on the wrong track, an appropriate order is given to the engineer by radiocommunications. An order like this can be transmitted in a timely manner, and that generally will make it possible to avoid stopping a train at the closed signal.

With traffic control centralization the dispatcher can transmit by radio to the engineer instructions on performing maneuvers and on train departure in accordance with the inhibit aspect of the exit signal and in some other cases.

In turn the engineer of a train that has stopped on a span has the right to inquire about assistance by radio and to obtain notification about how and when it will be rendered. There's the possibility of transmitting to the engineers of moving trains information on the completion of repair operations earlier than the time frame indicated in the notice, as well as orders about opening the track for train traffic.

As you see, with the assistance of radio there are quite a number of opportunities to influence acceleration of the industrial process in a practical manner. It was established by VNIIZhT [All-Union Scientific Research Institute of Railway Transportation] researchers that a single conversation of an assistant station master with an engineer about permission to pass closed station signals reduces the time for finding a train on a section by 6 minutes on the average. With the transmission of an order on putting a late train in the schedule it reduces the time by 8 minutes. And even the transmission of a speed limit message, however paradoxical this is, will make it possible to save 3 minutes. The fact is that if the radio isn't used, then it will be required to stop a train in some cases, and in others to apply the brake once again and then gather momentum.

Calculations show that on a 350-kilometer line train radiocommunications promote an increase of 1.4 percent in section speed with freight traffic and 0.96 percent with passenger traffic. The annual economic impact is more than 140,000 rubles.

This and other research conducted by VNIIZhT scientists and railway VUZ's confirm the high efficiency of using train radiocommunications in transportation.

Unfortunately, the actual utilization of radio equipment and the air waves is very low. Both fixed and locomotive radio sets are silent a larger part of the time. So then, there are many untapped resources that are being made available to train radiocommunications for improving the basic operating indicators of transportation.

Usually an enterprise, acquiring new equipment, knows why it needs it and tries to "squeeze out" of it everything that this equipment can provide in terms of its functional possibilities in order not only to justify the costs (to improve the indicators of its basic activities), but also to get as much profit as possible.

It turned out otherwise with train radiocommunications: nobody acquired them. All of their fixed devices are on the balance sheet of signals and communications divisions. They're involved with the maintenance and repair of these devices. And, naturally, they take all operating costs as referring to themselves. Any grievances are brought against divisions too. In a word, they're considered as the resource managers of train radiocommunications, although in no way can they have an influence on increasing the efficiency of this equipment since locomotive and traffic engineers practically operate it.

Fixed radio devices were presented to traffic engineers on what is called a silver platter--use this suitably and advantageously! They used it too--as

auxiliary means; in fact, it wasn't they who ordered this equipment and it wasn't they who paid for it. Indeed the responsibility for using train radio-communications wasn't defined in basic standardized documents. Precisely therefore, in a majority of cases its effectiveness remains a potential one. It's true, now an attempt is being made (and again on the initiative of communications engineers) in PTE [maintenance regulations], train traffic regulations and other documents to designate the role of train radiocommunications as a means of managing train traffic.

However, only having shown a personal interest in these means, having determined their place and role in the train traffic management system and having assessed the effect from using them in real and monetary indicators, can the traffic service become a truly zealous manager. This problem is now being exacerbated in connection with completion of the development of the new "Transport--PRS [Train Radiocommunications]" system that has large functional resources and is correspondingly more expensive.

The multivariable nature of building a new system requires the solution of such problems as selecting the types of PRS radio networks in conformity with a specific section, traffic volume, technical equipment, etc. In each specific case the use of a piece of equipment must be evaluated in economic terms and organically added to the processing method of train traffic management. In this regard, new equipment requires the assimilation of new processing methods too. The latter is closely connected with the commencement of assimilating means for documented recording of negotiations of dispatchers and assistant station masters with locomotive engineers by means of SHR-108 type magnetic tape recorders. Work is being conducted in this direction, but there wouldn't be any harm in accelerating it.

Accordingly, to date problem number one is to raise the efficiency of using train radiocommunications by means of a clear and precise determination of their role in each specific industrial process of train operations. The initiative here must belong to the traffic service.

9889
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RAIL SYSTEMS

MINISTRY LOCALIZES FINANCIAL, PRODUCTIVITY CONTROLS

Moscow GUDOK in Russian 16 Apr 86 p 2

[Article: "Official Section on Expanding the Rights of Labor Collectives"]

[Text] For purposes of expanding the independence of labor collectives and increasing their responsibility for achieving the highest final results the Ministry of Railways authorized railroad department chiefs to establish planning, cost accounting, and fund-generating indicators for line enterprises with regard to the features of their operating activities. The indicators, which are connected with the repair of rolling stock, are being established by the railroad services.

The generation of funds for material incentives, sociocultural measures and housing construction, and the development of production depending on the fulfillment of quotas according to approved fund-generating indicators must be provided at all levels of management. It's necessary to rigidly observe the rights granted to labor collectives in using the indicated funds.

The right was granted to line enterprises to obtain credits at institutions of USSR Gosbank for commodity stocks, production expenses and for other purposes. It's important to open current accounts at institutions of USSR Gosbank for all enterprises.

Railroad chiefs can write off from the balance sheets fixed capital (except rolling stock) that has become unserviceable prior to expiration of the amortized service life, as well as lease out locomotives and passenger railcars. They were ordered to increase supervision of full payment of the lease fee that is due.

Managers of railroads, railroad departments and cost accounting stations have the right to use the locally obtained revenues of railway stations for developing the material and technical base of the passenger and freight economy and for improving passenger service after depositing the sums that are stipulated by the plan for financing capital investments.

9889
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RAIL SYSTEMS

FINNS TO SUPPLY 2700 ENCLOSED BILEVEL RACK FLATCARS

Moscow GUDOK in Russian 22 Jun 86 p 2

[Article by A. Nasonov: "The 'Rautaruuki' Firm Delivers"]

[Text] It should be comfortable for a motor vehicle in them. During loading--after all there are two doors--the motor vehicles themselves are driven into and driven out of one railcar into another, and the rolling stock doesn't require uncoupling.

Series 11-835 railcars have one more advantage too over their older "brothers"--the open bilevel flatcars that so often one can see near the loading areas of motor vehicle plants. The novices have side walls and a roof.

"How many motor vehicles can the new railcar transport at one time?" we address Lukkari, the design service manager of the Finnish firm "Rautaruuki."

"Each level holds 10 motor vehicles such as the 'Volga,' or 12 'Zhiguli's,' or as many 'Moskvich's'."

In addition to Ministry of Railway workers there were Minavtoprom [Ministry of the Automotive Industry] representatives too at the reception of the new ones at the capital's Riga railway station.

Valeriy Vladimirovich Stroganov, senior engineer of the transportation department, says:

"They're interestingly solved too from the point of view of construction and from the position of design. And they're very convenient in operation."

"And how many railcars like these will still be delivered to our country?"

"Before the end of the year the firm will build 250 railcars according to our orders, and in general a contract was signed for 2,700."

There's one more question for Salman, director of the "Rautaruuki" firm's railcar production:

"Were there any difficulties in designing this specialized rolling stock?"



"Yes, of course, but the TsNIIV [Central Scientific Research Institute of Rail-car Building] staff members helped us. We especially had to take some pains with the doors. But we found an over-all solution--your sliding principle, as on container railcars, and our doors."

Consequently, you can encounter the new railcars on the country's roads as early as this year.

9889
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RAIL SYSTEMS

INSTITUTE CHIEF ON PLANNED LENINGRAD METRO DEVELOPMENT

Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Apr 86 p 2

[Interview with Chief of the "Lenmetrogiprotrans" [Leningrad State Metro Planning and Surveying Institute] Nikolay Ivanovich Kulagin by V. Tarasenko, LENINGRADSKAYA PRAVDA correspondent; date and place not specified; under "Urgent Interview" rubric: "The Metro Will Go Farther"]

[Text] Leningrad is growing. New construction projects are moving farther away from the center of the city. The new building occupants have all their hopes on the metro. That's why there are many letters in the editorial mail in which readers ask to speak about the prospects of further development of the Leningrad metro. Today Chief of the "Lenmetrogiprotrans" N. I. Kulagin responds to our correspondent's questions.

[Question] NIKOLAY IVANOVICH, BEFORE WE TALK ABOUT PROSPECTS TELL US PLEASE ABOUT TODAY'S METRO.

[Answer] As is well known, right now in our country there are underground railways in 11 cities. Ours is inferior only to the Moscow one. For the 30 years that the Leningrad metro has been working the length of its 4 lines has exceeded 80 kilometers, 48 stations are operating, and every day express trains transport more than 2.3 million passengers. During the 11th Five-Year Plan builders turned over 22.4 kilometers of underground main lines and 10 new stations. Having connected the center of the city with the microrayons of Veselyy Poselok, the Pravoberezhnaya line received the first passengers.

The city continues to build and the Leningrad metro is growing too. The general diagram for development of the Leningrad metro, which is a component part of the comprehensive diagram for development of all types of urban passenger transportation, is being put in practice.

[Question] HOW WILL THE LENINGRAD METRO BE DEVELOPED IN THE FUTURE? LET'S JUST DIVIDE THIS QUESTION--FIRST TELL US WHAT UNDERGROUND ROUTES WILL BE APPEARING IN THE CITY DURING THE 12TH FIVE YEAR-PLAN, AND THEN TELL US ABOUT LONGER RANGE PROSPECTS.

[Answer] As early as next year two new stations on the Moscow-Petrogradskaya line, which will continue from "Udelnaya" to the north, will become operational.

The first one of them--"Ozerki"--will be located at the intersection of Engels Prospekt and the Vyborg Highway and it will become a part of the new experimental city block that is being developed by architects of workshop 16 of LenNIIproyekt [Leningrad Scientific Research Institute for the Planning of Housing and Civil Engineering Construction]. The station itself was designed here too. It will be a single-vault one such as, for example, "Ploshchad Muzhestva." The walls will be faced with light-colored stone and light fixtures will be arranged along the center of a snow-white arch. It's planned to install an inlaid panel at the end of the station. The entire appearance of the "Ozerki" metro railway station must be light and airy and create an elated mood among the passengers. Thus the following authors solved it: USSR national architect G. N. Buldakov and architects V. V. Popov, V. N. Lovkachev, V. F. Drozdov, L. M. Chetyrkin, and I. I. Lokhanov.

The next station of the Moscow-Petrogradskaya line--"Prospekt Prosvetleniya"--is being constructed at the intersection of the prospect of the same name and Engels Prospekt. It's of the column type. White marble is being used basically for the facing, and they'll be setting up the floor out of light granite slabs with a dark design. The lighting will be original. The columns it seems will become "supporting structures" for the light arches. The authors of this station are architects Yu. V. Yeyenko and V. G. Sokolskiy.

In addition to the named stations, one more metro railway station on the Pravoberezhnaya line must be turned over next year. The station "Krasnykh Komissarov" will be located in the park at the intersection of Prospekt Bolshevikov and Dybenko Street. The theme of its architectural design is clear from the name. The authors of the project are LenNIIproyekt architects G. A. Vasiliyev, O. G. Kravtsov, and M. P. Antonov.

After this station it's planned to construct one more--"Narodnaya," which will become the last one on this section of the Pravoberezhnaya line. Only the "Nevskoye" electric depot will be beyond it.

[Question] IT'S ALREADY BEYOND THE 12TH FIVE YEAR PLAN.

[Answer] Yes. But let's return to the future. Construction has begun on a new section from Ploshchad Aleksandra Nevskogo to Ploshchad Mira--a length of 4.5 kilometers--on the very same Pravoberezhnaya line.

I'm not letting out a secret if I say that today, especially during rush hours, the inhabitants of Leningrad at the "Ploshchad Vosstaniya," "Gostinyy Dvor" and "Ploshchad Aleksandra Nevskogo" transfer junctions are experiencing many inconveniences. The Pravoberezhnaya line's new section with three metro railway stations--"Ligovskaya," "Vladimirskaya" and "Ploshchad Mira"--also will help to relieve these stations.

The first one of them will be located at the intersection of Ligovskiy Prospekt and Transportnyy Pereulok. The "Ligovskaya" entrance hall will be built into the production and everyday wing that is designed for metro services. "Vladimirskaya-2" will make its appearance opposite the existing station of the same name on the Kirovsk-Vyborg route. It's intended to modernize it. Here in

particular the number of passageways from the platforms to the middle hall will be increased to 12 without an interruption in train traffic. Subsequently a complex of crossings will be built under Vladimirskaya Ploshchad. A new station will be sited on Ploshchad Mira next to the existing one. Both metro stations will be connected with convenient crossings.

"Ploshchad Mira" only for a while will become the last one on the Pravoberezhnaya line, which will continue to the north to an area of mass residential construction on Bogatyrskiy Prospekt where it will be able to solve the transportation problem in a cardinal manner. This line after the "Admiralteyskaya" station (it will be located at the beginning of Nevskiy Prospekt) will pass under the Neva River, and once again having returned to the right bank it will go out along the Petrogradskiy side to the railway spur in the direction of Sestroretsk. Here one will be able to change to local electric trains. Farther on the route will pass beside the Central Park of Culture and Relaxation imeni S. M. Kirov (the metro railway station will be built not far from the main entrance) and go out to the area of Bogatyrskiy Prospekt. Its approximate length is 11 kilometers.

[Question] THIS CONCERNS THE PRESENT FIVE-YEAR PLAN. AND NOW ABOUT THE METRO DEVELOPMENT PROSPECTS THAT ARE PROVIDED FOR BY THE GENERAL DIAGRAM BEFORE THE YEAR 2000.

[Answer] A new underground main line will stretch from Ploshchad Mira through the existing "Pushkinskaya" station to the south to Kupchino. Under Bukharevskaya Street it will pass to Bela Kun Street and then farther to the south. It's intended to build eight stations here. This route will receive the name Frunzensko-Zhdanovskaya. The Pravoberezhnaya line, about the section of which from Ploshchad Mira to "Bogatyrskaya" I have already spoken, will give it a northern spur. Construction of a route to the area of Teatralnaya Ploshchad and then Lakhta will begin from Ploshchad Mira where, incidentally, the most intensive underground crossing of our city will be. It's intended as well to continue the Kirovsk-Vyborg line from "Prospekt Veteranov" to the area of Ligov. A new one--the Vолодарско-Пискаревская route--will also be making its appearance: from the "Kirovskiy Zavod" station it will pass through the Obvodnyy Canal to Ploshchad Vosstaniya and farther on in the direction of Piskarevka.

Of course, corrective amendments that are aimed at improving transportation service can be incorporated into the metro development diagram.

[Question] WHEN WE SPEAK ABOUT METRO DEVELOPMENT, THEN WE MEAN NOT ONLY NEW ROUTES. THERE'S A NO LESS IMPORTANT PROBLEM--TECHNICAL PROGRESS ON THE UNDERGROUND MAIN LINES.

[Answer] Metro plans are created with regard to the use of advanced, economically sound designs, modern manufacturing methods, and improved automatic and remote control devices. The first deeply laid, single-vaulted stations in domestic practice made their appearance in our very city. The passengers and operating staff liked them.

The Leningrad metro tunnels are equipped with automatic train control systems. Automatic and remote control also give orders to the escalators and heavy-duty exhaust fans here. Industrial television has found a use too. And now "Lenmetrogiprotrans" specialists jointly with metro workers and LIIZhT [Leningrad Institute of Railroad Transportation Engineers] scientists within the framework of the "Intensification-90" industrial program are creating a station operation control system. It will make it possible in a practical manner to control the entire complex and diverse facilities of an underground railway station from a single console. And in turn it will be connected with a controller who performs over-all supervision in terms of the entire metro.

All the new technical items will promote an improvement in train traffic safety, more reliable and smooth functioning operation of the underground main line, and an improvement in passenger service conditions.

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RAIL SYSTEMS

CHIEF ON NORTH CAUCASUS RAILROAD FOODSTUFFS TRANSPORT SYSTEM

Moscow ZHELEZNODOROZHNYY TRANSPORT in Russian No 4, Apr 86 pp 10-16

[Article by North Caucasus Railroad Chief F. M. Kotlyarenko, Rostov-na-Donu, under the rubric "Transportation for the Agro-Industrial Complex": "Our Immediate Concern"]

[Excerpt] The railroads are entering a crucial time for agricultural shipping. Many hundreds of railcars with seed grain, mineral fertilizers, agricultural equipment and fuels and lubricants are already delivered to designated points along the steel mainlines. The dispatch of fresh fruits and vegetables is expanding. To ship all of this freight in compressed time periods and without losses is the duty of all the employees of railroad transport. The selection of articles published below discusses the improvement of the system of transportation service for the agro-industrial complex and the immediate tasks of organizing the shipping of perishable freight.

The North Caucasus has a quite developed network of rail connections. The pivot of the transportation system of the region in the North Caucasus Railroad. The largest proportion of total freight traffic falls to its lot.

The volume and structure of shipping on the railroad is greatly determined by the requirements of the largest agricultural region of the country, producing a considerable portion of the grain, meat, vegetable, fruit, grapes, melons and gourds, for transport service. At the same time, agricultural equipment, mineral fertilizers and fuels and lubricants are delivered here in large quantities. Considering the share of agricultural freight in the total volume of shipping, it can be said that in the summer and fall period it exceeds 22 percent. This shipping is distinguished by irregularity and the concentration of dispatches in the periods of harvests and the mass procurements of farming and animal-husbandry products.

All of this defines the role and significance of the railroad overall and the particular responsibility of its collective for reliable transportation service for the USSR Food Program. In the 11th Five-Year Plan, the improvement of the forms and methods of transport service for agriculture

continued. The existing system is constantly renewed and, under the new conditions of interaction with the enterprises of the agro-industrial complex, is receiving further creative development.

The formation of agro-industrial complexes made it possible to combine the efforts of the partners of agricultural production--the enterprises producing agricultural products, as well as the associations serving them with agricultural equipment repair and the enterprises for procurement, processing and sale of products and agricultural construction organizations. Under these conditions, better opportunities were created for the joint effective resolution of questions of the timely and complete satisfaction of the need for agricultural-product and freight shipment for towns and the simultaneous improvement of the utilization of rolling stock and the reduction of the transportation expenses of kolkhozes, sovkhozes and other enterprises.

The chief areas of this work were also determined: improving the methods of transporting agricultural products, mechanizing loading and unloading operations, containerizing freight shipments on the "field--railcar" principle, rationally utilizing the freight and volumetric capacities of railcars, ensuring the preservation of the freight shipped etc.

The Centralization of Management

Large volumes of grain shipments and the increased demand it places on rolling stock allotted for it requires a precise system for ensuring shipments. Such a system has been developed on the railroad based on the dispatcher control of the direction and distribution of boxcar and specialized rolling stock among the washing, preparation and grain-loading points. The train service constantly monitors the organization of the routing from the empty boxcars at the technical stations and their subsequent admission to the washing and repair points (PRP) and ensures a precise rhythm in the operation of these points. The chief of the operational-control department, utilizing information on the movement of empty car traffic, plans the supply and admission of empty boxcars to the washing points the next day and establishes targets for all divisions for the issue of empty-car routings. The movement of fixed routings is monitored by the shift workers and deputy chiefs of the operational-control department, who coordinate the operation of the divisions at dispatch points and for the railroad overall.

All washing points of the Caucasus, Mineralnyye Vody, Stavropol and Salsk divisions are supplied with empty boxcars free of tare freights and receive entire consists of boxcars from the Groznyy and Makhachkala divisions. The formation of technical routings is organized for this purpose from empty railcars that arrive from the Azerbaijan Railroad and are freed of freight. Repaired and prepared grain boxcars are accumulated at the stations up to a full routing or are, where necessary, collected from two or three stations. The grain routing is assigned a number which it follows to the designated station with high routing speed behind passenger trains.

Along with boxcars, several hundred grain cars are utilized for the shipment of grain each day. The operation of grain cars is reflected in a special schedule. This permits a strict accounting for operations and the knowledge

of their locations at every hour. Based on an analysis of the loading and unloading of grain cars, cruising plans were established for them that permit a reduction in empty runs, an acceleration of turnover and the assurance of fulfillment of the daily plan for grain loading.

The procedure that was developed and incorporated on the railroad for forming up and sending empty boxcars to washing points permits the uninterrupted creation of loading resources and does not permit the movement of cars in the direction counter to traffic. And, especially importantly, we obtained the possibility of forecasting the coverage of grain shipment in a two or three day period.

A third procedure was established for presenting the requests of grain-product administrations for shipping in the upcoming month with the simultaneous presentation of the plan for the dispatch of grain by fixed routings. The plan assigned by the ministry for the fixed-routing shipment of grain in 1985 was adequately fulfilled by the railroad. The level of fixed routing was 18-20 percent. During the mass harvesting period, up to 50 percent of the grain was dispatched by fixed routings in the Krasnodar and Salsk divisions.

In recent years approximately half of the grain shipping volume was carried out by special rolling stock. The utilization of hopper grain cars made it possible to mechanize the labor-intensive loading and unloading processes and reduce grain losses in shipping to a minimum. Some 60 percent of the grain is currently shipped in grain cars in the Salsk Division.

Grain shipping on combined connections with the participation of river transport is growing. In 1985, 660,000 tons of grain were shipped through the Rostov, Volgodonsk and Yeysk port elevators. All grain was delivered by fixed routing, basically with grain cars. At the Rostov and Volgodonsk elevators alone, more than 190 grain routings arrived. As a rule, grain of the new harvest each year is sent by the first routing to Moscow on economized fuel and power resources.

The labor collaboration of the collectives of the stations, grain receiving points and elevators is being reinforced in the struggle to ensure the timely and loss-free shipping of grain. The initiative of the Salsk railroad employees, approved by the Rostov CPSU obkom, Dorprofsozh [Railroad Committee of the Railroad Transportation Workers' Trade], MPS [Ministry of Railways] and the trade-union central committee, which envisages the providing of full preservation of shipped national-economic freight, was widely disseminated.

The seminar classes for the railroad employees and the grain procurers on studying the rules and conditions of shipping conducted before the start of shipping play an important role in the preservation of grain shipments. In conjunction with oblast and kray administrations of grain products, we are eliminating the causes that give rise to violations of shipping rules. We conduct more than 2,500 monitoring weight checks every month, and their number increases to 3,500-4,000 in the mass shipping period. The public inspectors and commercial controllers systematically verify the fulfillment of the rules of grain loading and placement in railcars by the elevator workers. The

continuous monitoring made it possible to reinforce considerably discipline in the observance of the Railroad Charter and the Rules of Freight Shipping by the procurement and station workers.

Especial attention is devoted to monitoring the correct placement and reinforcement of grain shields. Before the onset of mass grain shipping, a stockpile of grain shields is created on the railroad. The freight dispatchers assist the railroad workers by repairing more than 10,000 shields each year.

Since the first days of shipping of the new grain harvest, society is included in the struggle for its preservation. Some 67 people's control committees, 23 Komsomol Posts, 32 trip teams and 12 Komsomol Searchlights take part in this work. Staffs headed by deputy division chiefs have been created in the railroad divisions.

The Further Development of Support Stations

A most important link in transportation service for the agro-industrial complex is support stations. I remind our readers that our railroad is the initiator of their creation. Over the preceding years, the technical tooling and technology of operation of support stations has changed substantially. Tens of millions of rubles from all sources of financing have been invested in the development of their freight facilities. Currently, every such station has the appropriate track development and complex of freight apparatus: cranes, raised track for the unloading of bulk freight, high platforms for loading and unloading equipment, enclosed warehouses, and various machinery, workshops, service and living accommodations, communications equipment and power supplies.

Some 85-87 percent of the railcars that arrive with freight for agriculture are handled by the manpower of the mechanized subdivisions for loading and unloading operations. At less active stations, where to develop the facilities and constantly maintain the machinery and personnel is not expedient, cars are unloaded by mobile mechanized teams. They account for nearly 600,000 tons of handled freight a year.

Accumulated experience in the concentration of freight operations convincingly testifies to the fact that support stations are a most progressive and economically advantageous form of transport service in the national economy. Thus, in the agricultural enterprises and the organizations located on the boundaries of the railroad alone, more than 1,000 people have been freed up to work immediately in agricultural production.

Currently the labor collaboration, begun on the initiative of the Salsk railroad employees, is being further developed. A program for the further strengthening of the material and technical base of support stations is being implemented on a broader scale with the participation of the agro-industrial associations. At the same time, the siding facilities of the enterprises of agro-industrial associations are being expanded. Capacious new freight depots have been built and placed in operation at the Taganrog, Rostov-Tovarnyy, Zapadnyy, Azov, Tsimlyanskaya and other stations. The inventory of loading

and unloading machinery and equipment was replenished with 140 units. Electric traveling gantry cranes with increased lift capacity, L-34, TO-25 and TO-18 front loaders, small-sized diesel loaders, truck cranes, excavators and other equipment have been placed in operation. The track development of support stations has been strengthened and their premises have been improved.

At the same time, a number of stations and adjoining sidings still remain at low capacity and do not fully handle matters, especially with the unloading of railcars that arrive from agricultural enterprises. In this regard, the value of the resolution on strengthening the comprehensive tooling of freight facilities of the Konnoarmeyskaya, Mechetinskaya, Trubetskaya, Zimovniki, Remontnaya, Peschanokopskaya and Tsimlyanskaya support stations of the Salsk Division, adopted upon coordination with oblast departments, should be noted. This resolution was supported by the Rostov Oblast Party Committee.

In accordance with the projected program, much work is being conducted at the stations in conjunction with the enterprises of the agro-industrial associations. Thus, according to agreements on the proportionate participation in the construction of freight depots and apparatus at the Peschanokopskaya and Mechetinskaya stations, electric traveling gantry cranes will be installed, modern raised track and sanitation and living structures will be built, and the improvement and enclosing of the premises will be carried out in 1986-87. The construction of capacity for the draining of molasses and trestles for the unloading of freight is envisaged. At Tsimlyanskaya Station, an area has already been placed in operation for the handling of large freight containers, along with a newly raised track at Remontnaya and the first stage of a new freight depot at Trubetskaya. The reconstruction of freight depots has been completed at Konnoarmeyskaya, Zimovniki, Remontnaya and Mechetinskaya stations. With the agreement of the Salsk Division, the ispolkom of the Remontnenskiy Rayon adopted a resolution for the construction of an inter-service freight depot at Zimovniki Station with all the essential apparatus and sidings.

An example of the comprehensive development of a support station on the railroad is Timashevskaya Station of the Krasnodar Division. This enterprise became the organizing center for the development and strengthening of railroad facilities for the agro-industrial complex of the region. The station workers rendered assistance in the planning and construction of a number of sidings. Their placement into operation allowed much improvement in the transport service for related industry workers and the utilization of the rolling stock. Thus, the Sadovod Fruit Sovkhoz was able to dispatch its produce in 5-10-car refrigerated sections, and the grain-products combine could conduct loading and unloading around the clock.

Constantly developing and improving the forms of labor cooperation, the collective of the station, in conjunction with the employees of the material and technical supply service, organized the centralized removal of freight with the transport forwarding service of kolkhozes and other agricultural organizations. Six facilities were adopted for service. Two men are occupied with this work instead of 10-11 representatives of the kolkhozes.

The station has at its disposal a powerful car-loading preparation point. It fully meets the needs of shippers for railcars and, furthermore, prepares cars for grain loading at Novorossiysk Station and adjacent sections. Special track for the repair of cars with a large number of flaws was built where an electric traveling gantry crane was installed and the changing of wheelsets, repairs and the hanging of doors are carried out. Especial attention is devoted to the issue of cars for grain. The feeding of rolling stock to the preparation point is conducted according to a schedule. The harmonious and precise work of the station collective and related industry workers ensured the steady fulfillment of the preparation and unloading plans and the undeviating reduction of railcar idle time.

Great needs are met by the support stations of Yeysk, where an excellent raised track was built, and Zenzeli and a number of other stations that provide for the seasonal dispatch of melons. Additional track has been laid here, the freight workfronts have been expanded and mechanization has been introduced.

For the railroad overall, there are more than 400 sidings for the enterprises of agriculture, procurement, the fruit and vegetable industry, and material and technical supply, where the track and warehouses are being developed and the inventory of loading and unloading machinery and equipment is being expanded.

The policy of reinforcing the material and technical base of the support stations in a complex with the railroad facilities of enterprises of the agro-industrial associations is producing positive results. In particular, over the last three years the idle time of railcars on the sidings of many agricultural enterprises and the organizations serving them was reduced by 0.5-0.81 hours. For the railroad overall, the idle time of railcars on sidings has been reduced by 0.8 hours.

The collectives of railroad employees and the workers of agro-industrial associations are achieving the further reinforcement and development of support stations. The current winter placed before the related-industry workers a series of problems in ensuring the timely unloading of railcars. As a rule, the workers at support stations, in labor cooperation with the dispatchers and recipients of freight, successfully overcame the difficulties that arose.

The Shipping of Perishable Produce

The North Caucasus Railroad provides for the shipment of considerable volumes of fruit and vegetable produce and other perishable freight. It serves more than 270 rayon procurement offices and fruit-and-vegetable sovkhozes, 160 cold-storage warehouses, fish processing plants and egg farms, 150 enterprises producing non-alcoholic beverages, 70 canned-food plants and combines, approximately 90 poultry packing combines and butter-and-cheese combines and a whole series of other organizations that dispatches perishable produce.

For the organization of the rapid and well-preserved delivery of perishable freight for railroad consumers, an integrated technology was developed and

incorporated that envisages optimal solutions for the whole cycle of the shipping process, including the loading of cars and the organization of the shipping of specific types of freight. Every year, preliminary shipping volumes are determined in advance and, taking them into account, the necessary supply of empty boxcars and insulated railcars along with vegetable shields is created. Routine repair is conducted on disinfecting stations, ice points and ice plants, watering lines and livestock platforms. A conference of the workers of the divisions and representatives of the procurement organizations, associations of the fruit-and-vegetable industry, trade and other organizations is held at the railroad administration, at which questions of the organization of the shipping of perishable produce and providing for its preservation in transporting are resolved and ways of eliminating bottlenecks are planned.

In order to ensure the better satisfaction of popular requirements for fruits and vegetables, their shipping from the bases of the procurement organizations of consumer cooperatives is carried out on demand without limitation on the basis of requests that should be issued five days before the start of loading.

We devote especial attention on the railroad to the shipping of melons. More than a third of the total volume of melon and gourd freight is dispatched by routings. In the period of their mass submittal, 250-300 and more railcars are dispatched daily. The loading of melons is carried out on the direct "field--motor vehicle--railcar" variant with its concentration at a small number of stations.

Every year the Groznyy Division, in conjunction with the Limanskiy and Narimanovskiy rayon procurement offices, develops specific plans for organizational and technical measures that envisage the successful assimilation of growing volumes of loading and dispatching melons and vegetables. The related-industry workers jointly lay additional track and strengthen the technical tooling of the stations and sidings.

And, of course, an especial role in the integrated technology of shipping foodstuffs belongs to the efficient utilization of refrigerated railcars. It envisages a unified system of information on their arrival, operational planning, the preparation of cars for loading, the organization of loading and unloading, the operation of technical stations, operational dispatcher control and the monitoring of the utilization of refrigerated rolling stock. A whole series of organizational and technical measures has been conducted and the necessary technical base has been created for the repair, inspection and handling of refrigerated cars.

A feature of railroad technology is the flow-line preparation of automatic refrigerated cars (ARV) for loading. Earlier, each division maintained refrigerated cars for "its own" loading stations alone. This caused many empty runs. According to the new technology, all ARV maintenance points prepare cars in the same direction of empty traffic regardless of the boundaries of the division. As a result, empty railcar runs were reduced by 81 percent, and full runs by 44 kilometers. The total length of railroad sections where oncoming runs of empty ARVs were eliminated exceeds 1,600 kilometers.

For the maximum reduction of railcar idle time in loading and technical operations, the acceleration of their movement and the elimination of oncoming and other irrational runs, the technical stations, under the new technology, are planning work on the maintenance and passage of refrigerated rolling stock on the basis of preliminary information obtained from the refrigerated-transport workers of way stations and railroad divisions. In the mass shipments period of fresh cabbage, in order to ensure its delivery from the Azerbaijan Railroad, up to 20 shuttle routings are formed from ARVs, and additional mechanics teams are sent from other PTOs [technical inspection points] in order to strengthen the ARV PTOs at Bataysk and Derbent stations.

Much work is being conducted in conjunction with freight shippers on consolidating orders with the aim of intensifying the utilization of grouped refrigerated rolling stock.

The Refrizherator-2 management automation system has been introduced, and continues to be improved, on the railroad, and is intended for the centralized accounting and regulation of the utilization of refrigerated rolling stock. It makes it possible to determine the dislocation of refrigerated sections and trains twice a day (at 6:00 AM and 6:00 PM) and to account for the number of loaded and unloaded sections and their idle time in freight operations, receiving and turnover from railroad to railroad and between divisions. A display has been installed in the department of the perishable-freight shipping department of the containerized shipping and commercial operations service that displays on the screen in interactive mode the necessary information about the location, number and type of railcars and the destination of refrigerated rolling stock.

In the fruit and vegetable mass shipments period, the method of shipping fresh strawberries, cherries and cucumbers in refrigerated cars as a trailer to passenger trains is widely utilized on the railroad. This method is employed at the Belorechenskaya, Kurgannaya, Adler, Tikhoretskaya and Konokovo stations, where passenger trains have stops. The cars with fresh fruits and vegetables are attached at the head of the passenger trains. They are destined for the incoming stations of the Moscow and Leningrad centers. With a loading volume of more than 10 cars a day, an ARV train is formed up that follows the path of the passenger train.

Strict dispatcher monitoring of the rapid movement of the railcars with fresh produce is maintained. The maintenance of loaded ARVs is conducted while they are stopped at the Kurgannaya, Adler, Belorechenskaya, Kavkazskaya, Timashevskaya and Rostov-Glavnyy passenger stations. The stations and destination railroads, transit stations and adjacent ARV maintenance points are informed of the departure of railcars at passenger speeds by the dispatching and attaching stations. In May or June of each year, roughly 100-150 cars are dispatched in this manner to trade organizations of Moscow and Leningrad, loaded with fresh strawberries, cherries and cucumbers.

The workers of the Makhachkala Division, in conjunction with the shippers using this process, have improved the quality of the planning and organization of grape and produce shipping. Taking into account the fact that grapes are shipped over a very short period (10-15 days), the careful preparation of all

the facilities of the division stations and the sovkhozes for the fulfillment of this important state task has exceptionally great significance. With this aim, the size of grape loads are elaborated in advance and the required number of empty refrigerated cars is sent to the allotted stations. The loading of grapes is done directly with the placement of boxes in no fewer than 12 rows to the height of the car.

The strict observance of this process and the precise interaction of all of its participants--the employees of the sovkhozes, the procurers and the railroad workers--makes possible the successful dispatch and delivery of grapes in the shortest time periods without losses each year.

Along with this, in the period from September to May, the shipping of live fish and fish stock is carried out on the railroad in live-fish cars that are also attached to passenger and passenger-freight trains. Freshwater fish are delivered alive to the shipping stations after their retention in ponds with running water. Healthy, active and well-nourished fish are loaded in live-fish cars 4-6 hours before departure. The temperature of the water and its enrichment with oxygen are strictly regulated. The entire fleet of live-fish cars is given over to the leased utilization of the cold-storage enterprises of the Ministry of the Fishing Industry. Constant monitoring of the movement of loaded live-fish cars is established and stopping them for more than 4 hours is not permitted.

The constant search for new forms of improvement in the shipping of perishable freight and the broad application of progressive technological processes allows the collective of the railroad to assimilate successfully the growing traffic flow. In 1985, more than 147,000 carloads of perishable freight was shipped, whereby the plan was considerably overfulfilled, especially for vegetables, fruits, canned goods and meats.

Expansion of the shipping of perishable freight is facilitated by the systematic strengthening of the refrigerated facilities, which include the principal depot at Tikhoretskaya and eight enlarged and five monitoring ARV PTOs. A shop for the routine repair of refrigerated sections was built in the refrigerated-car depot at Tikhoretskaya. The area of the shop for the capital repair of diesel units was expanded and a process line for their repair was incorporated. The construction of a major shop for the depot repair of ARVs is continuing. The depot is steadily fulfilling the repair plan, reducing the idle time of refrigerated cars, successfully coping with the shipping plan and is a leading enterprise of the railroad.

The expansion of the technical base and its reinforcement will allow us to more than double the preparation of refrigerated cars (especially ARVs) for loading, as well as expand considerably the program for the renovation of the registered fleet in the 12th Five-Year Plan. We note in this regard that the manpower of the depot at Tikhoretskaya has already modernized the diesels on a large number of refrigerated sections and the wiring has been completely replaced. And, especially importantly, 80 percent of the registered fleet of refrigerated sections has been taken on for socialist preservation by maintenance teams.

In order to render technical assistance to teams on the railroad, two workshop cars are in operation that are fitted out with all necessary materials and spare parts. They are maintained by qualified specialists.

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RAIL SYSTEMS

COORDINATING CENTER FOR RAIL FOODSTUFFS SHIPMENT URGED

Moscow GUDOK in Russian 16 May 86 p 2

[Article by Professor and Doctor of Technical Sciences M. Terterov, department head at LIZhT [Leningrad Institute of Railroad Transportation Engineers], under "Manage in a Competent Manner" rubric: "Agro-Industrial Association Products: Problems in Delivery"]

[Text] To produce foodstuffs is only half of the matter. It's necessary to preserve and deliver them to the consumer in a high grade form.

It isn't so simple to do this. Many areas for the production and consumption of foodstuffs are considerably removed from each other, and the highly complex system for delivering them still hasn't been debugged.

Unfortunately, the process itself of procuring and delivering perishable products leads to a considerable amount of losses. These losses are associated with a breach in the processing methods of shipments and with the loading into railcars of agricultural and animal husbandry products that are off-grade and unsuitable not only for storage, but also for shipping.

A five-railcar refrigerator section was loaded with grapes. But it turned out that this sun berry had different gathering dates and prior to shipment it was stored 10 days in unsuitable accommodations. And there was a quite natural finale: the grapes arrived at their destination unsuitable for use. The loss was nearly 40,000 rubles.

A similar case occurred with tangerines. Low quality, dirty fruit was loaded into railcars. The tangerines arrived half-rotten in Leningrad. The loss exceeded 35,000 rubles.

And how many losses are occurring during the shipment of potatoes! The shipping of wet tubers, which aren't free of dirt and are unsorted, with mechanical damages leads to losses from 2,000 to 14,000 rubles for just a single lot of freight!

Frequently it happens that in the country's hot regions the loading of perishable products continues for days. Thus tomatoes at one of the southern stations

were loaded in railcars for 31 hours. This lot arrived in Leningrad with losses at the sum of 8,000 rubles.

It isn't a secret for anybody that it's necessary to store and transport perishable products with the observation of special temperature conditions. However, hitherto standard optimum conditions haven't been developed for storing freight both in permanently installed refrigerators and during transit. And the inter-departmental disunity of consigners and transportation workers is to blame for that.

A case like this is significant too. Intensive construction of permanently installed refrigerators is being done right now. Their standardized plans are developed and automatic equipment is provided for. But almost nothing is being done in our country for making transshipping processes more efficient. Scientific research proves that the optimum loading and unloading area of refrigerators is bound to be designed for five or more railcars. In practice, even at new refrigerators, the area frequently doesn't exceed two to three railcars. A reduced area that was placed in the plan creates only an apparent savings of capital during construction. All the same this savings is turned into losses that are associated with the layover of expensive refrigerated railcars.

When determining the loading and unloading areas at operating refrigerators, their workers--having referred to the inaccurate formulations of official documents--try to reduce these areas to a minimum. For example, they're installing them here and there on the basis of the number of doorways in a refrigerator flatcar. Declaring some doors as nonoperating ones, consignees artificially reduce their freight areas. This is advantageous for them. But, in fact, unloading locations don't depend on the number of doorways, but on the availability of insulated industrial lines. And, proceeding from such a statement of the problem, one can double them.

Today, while receiving fruits and vegetables for shipment, the railroad is taking an additional responsibility upon itself--to cool them in refrigerator sections and trains where the cost of generating cold is 5-10 times higher than in permanently installed refrigerators. Apparently the necessity has matured to collect an additional fee from consigners for cooling fruits and vegetables during transit in refrigerated railcars. Then they will regard the construction of precooling stations more responsibly. This problem is of state-wide importance, and it's necessary to solve it in a comprehensive manner.

Taking into consideration the fact that right now consigners have begun to build themselves refrigerators at kolkhozes and sovkhozes, and while it isn't too late, it's necessary to reorient them toward the construction of heavy-duty interkolkhoz refrigerators at loading stations. This will allow consigners to send really high grade products to the railroad.

Problems of coordinating the work of railway workers and sailors are of enormous importance at a majority of ports. As a matter of fact, it's no secret that at some ports scarce and expensive refrigerated rolling stock is waiting for the arrival of a ship up to 12 hours, and individual ones are laying over up to 15 hours too.

The assimilation of refrigerated container railcars was begun during recent years. These containers conform most to the shipping conditions of perishable freight. The use of them during the delivery of meat and meat products, for example, from Estonia to Leningrad's self-service stores makes it possible to save 12 rubles on 1 ton. Quite a lot has been said already about the efficiency and advantages of this shipping method. However, hitherto our industry never set up mass output of refrigerated container railcars. And what a pity that quite a lot of good ideas perish in the interdepartmental corridors. Let's take those same container railcars. To whom will they belong? Who will finance their production and who will service them? There are no opponents among the container railcars, but the matter with their production and operation isn't budging and one department puts the blame on another.

There are other problems too. Who isn't aware of the awkwardness in the process of executing freight documents, and that considerably hinders the assimilation of ASU [automated control systems] here. And once again at this point the interests of some ministries are contiguous and countervailing. And if that's the case, then it turns out that it's very difficult to simplify the procedure for preparing documents and transmitting information. And the question suggests itself: why shouldn't we create an authoritative interdepartmental group for the development of a simple and legally and logically justifiable operating plan with documents that makes it possible to use ASU? Undoubtedly the expenditures on this would pay for themselves with interest. However, it's necessary to speak too about staffs that participate in operations that accompany shipments. During the transshipment of fruit from maritime transportation to rail transportation, port, rail and chamber of commerce representatives are at each railcar. Port employees turn over the cargo, chamber of commerce representatives receive it, and railway workers seal the railcars and thereby relieve the dock workers of responsibility for loading quality. If this is convenient for the port employees, then it's not quite for the railway workers. As a matter of fact, a railway representative can't keep an eye on the entire loading process and uncover all the flaws of the loading crews, and as a result both the railroad and the state as a whole bear the losses. Having organized the shipment of freight after the port's sealings, it would be possible to considerably simplify the processing methods of executing documents and, consequently, to reduce the cost of the process too. And, apparently, it's necessary to revitalize the forgotten practice of dispatching ships and railcars with a guarantee stamp.

The work of Mintorg [Ministry of Trade] and Minrybkhoz [Ministry of the Fish Industry] leaves much to be desired. Frequently fish of the very same designation are sent from the Far East to the Baltic or Volga regions, and from there they're sent to regions of Siberia. The very same thing occurs with the shipment of vegetables, fruit and other freight. Inefficient cross hauls are a result of the absence of comprehensive planning.

In my opinion, it's high time to create a center that not only would plan, but also would manage the complex system for shipping products of the agro-industrial complex in a practical manner. It would assume particular importance for the advancement of perishable freight. The center must have scientific subunits [podrazdeleniya] for the development of theoretical problems, including railway transportation problems too.

RAIL SYSTEMS

RAILWAYS SECURITY CHIEF ON PLANNED ANTI-CRIME MEASURES

Moscow GUDOK in Russian 7 Jun 86 p 2

[Article by A. Kasyanov, chief of the MPS [Ministry of Railways] Armed Security Administration: "Complete Protection for Freight"]

[Text] "THE COMPLETE PROTECTION OF FREIGHT BEING SHIPPED ON RAIL TRANSPORTATION HAS NOW BECOME THE MOST IMPORTANT REQUIREMENT OF THE DAY. ALL OPERATIONS FOR PROVIDING PROTECTION REQUIRE A RADICAL REORGANIZATION."

These words were taken from a letter of E. Bayturayev, Yermentau station master of the Tselin Railroad. Quite a number of similar letters arrive at the MPS main administrations and at the GUDOK newspaper. With sincere personal interest their authors share their suggestions, opinions and advice on how better to organize the campaign for protecting national economic freight. Railway workers must deliver everything entrusted for shipment without losses. A not inconsiderable role in this is assigned to the armed security of MPS. And reorganization has already begun here.

The articles "A Lone Rifleman in Transit Isn't a Soldier," "I'll Buy a Stolen Storage Battery," "Disconnect the Bureaucratic Brake" and "Charged With Protecting Freight," which were published in the GUDOK newspaper, were carefully examined at an expanded technical council of the ministry's armed security administration. The proposals expressed in them, as well as at group conferences on the protection of freight being shipped, were the basis of our administration's operational plan.

What specifically is being done and what was done already? In the armed security subunits [podrazdeleniye] correspondence and accounting have been reduced by 60 percent. They began to hold fewer conferences of various kinds. Command personnel got the opportunity to make use of the line more often for solving practical problems locally and for increasing supervision in the organization of service operations. Staffs are being revised, and changes and a projected reduction in command personnel will be incorporated in the current management structure.

A program was approved for the 12th Five-Year Plan in assimilating state-of-the-art hardware, particularly that such as night vision devices and systems for centralized security of installations. At the present time all crews are

equipped with portable and fixed radio sets. During this year 2,000 "Transport" type radio sets have been received already. During this five-year plan it's planned to provide the rifleman who guards freight in transit with radiocommunications with the locomotive crew.

For the first time they have begun to use computer technology for providing freight protection in railway transportation. During a period of 4-6 hours prior to a train's approach, many subunits are now receiving information on railcars with freight, which is subject to security, by inquiry or in an automatic mode from railroad and station computer centers directly on a teletype or display unit installed in the guardroom. At any moment the guard commander can find out about the presence of railcars with valuable cargo on all tracks and in each of the stations' yards.

Industrial television is used for freight security at general use stations, container depots, as well as at major switchyards. It's true, there are still not enough television installations being used, but their number will triple during the five-year plan.

Quite a number of misappropriations are occurring in the shipment of motor vehicle and tractor equipment--especially in open rolling stock, including on double-deck flatcars too, where freight is accessible to unauthorized persons. Right now the output of flatcars like these has ceased. In accordance with an MPS order a new type of covered rolling stock was developed for shipping passenger cars, and the first lot of it will reach the country's main lines as early as this year.

At the present time scientific research institutes and the design bureaus and production associations of MPS and other ministries are creating systems for centralized surveillance of railway installations that are being protected, television cameras for limited visibility conditions, night vision devices and other security hardware. Studies are being conducted on creating a detection and alarm system for the protection of railcars with valuable freight, including also open rolling stock for shipping motor vehicle and tractor equipment.

Quite a lot is being done for assigning our personnel. With that aim in view more consideration is being given to improving their welfare and working conditions. During the years of the past five-year plan, the wages of armed security workers grew on the average of 9 percent. A total of 16 modern well-built barracks with all the amenities, fire stations and other service facilities were built with a total volume of capital investments of 4.2 million rubles. The armed security rest and relaxation building was renovated for 200 places. Annually 100 travel authorizations are issued for 24 days at a Sukhumi balneological hospital.

New contracts have now been concluded with all suppliers for the delivery of special work clothing, and monitoring of its quality and deliveries within established time frames has been imposed.

An experimental shipment of motor vehicles with their escort by an armed security detail all the way through was conducted by an order of the MPS and the

Ministry of the Automotive Industry at the Gorkiy and Kuybyshev Railroads. Special passenger railcars for passage of the details were placed on the routes. The results of the experiment were evaluated positively, and later on it's projected to practice it more extensively.

The protection of motor vehicle and tractor equipment is promoted by shipping it on routes. And if one were to judge by the data under discussion, then it would seem the situation with this isn't bad. Thus, in March the Motor Vehicle Plant imeni Likhachev fulfilled the through-freight organization plan by almost 93 percent, and the Zaporozhye plant by 91 percent. However, their routes were scattered at the nearest stations and in several directions. In March ZIL [Motor Vehicle Plant imeni Likhachev] dispatched a total of 10 percent, VAZ [Volga Motor Vehicle Plant] 14 percent, and GAZ [Gorkiy Motor Vehicle Plant] 10.5 percent of the direct destination trains. The Zaporozhye plant didn't dispatch a single route like this at all.

And what is more, enterprises are dispatching products in small groups on the same railroad over the course of 3-4 days. For example, on 2 March the Moscow AZLK [Motor Vehicle Plant imeni Leninist Komsomol] dispatched five flatcars on the Odessa Railroad, on 3 March it dispatched eight, and on 4 March it dispatched three flatcars. But, in fact, it was possible to dispatch them in the same train on any of the 3 days.

Similar dispatches are occurring daily from many plants. Where will we get riflemen for all of them? There aren't enough of them. So then a real, and not the one under discussion, through-freight organization is needed.

Great responsibility for the protection of freight rests on the workers of commercial inspection stations. But quite a number of complaints are being expressed about them in an entirely justified manner. While changing to operations according to the Belorussian main line method, the managers of individual railroads decided to combine the occupations of an armed security rifleman and a PKO [commercial inspection station] worker. Similar decisions that were made at the Southern, North Caucasus, Central Asian, and Alma-Ata Railroads are neither legally nor practically justified.

There's one more specimen of ill-considered actions. At the Gorkiy Railroad a telegram, in which it was stated that for purposes of easing the labor of female receiving and delivery agents at PKO's it's necessary to charge armed security riflemen with receiving, detecting and eliminating commercial rejects and sealing motor vehicle and tractor equipment, was addressed to all station masters and department chiefs who have PKO's and armed security subunits. I don't have anything against improving the working conditions of women. But it's impossible to give riflemen a full-time job, which isn't inherent in their own, to the detriment of protecting freight! By the way, at this same Gorkiy Railroad--especially at the Vladimir and Shakhunya stations and a number of others--they just aren't very concerned about VOKhR [armed security] representatives. The service facilities there are in critical condition, and there is no place for people to rest and relax in a normal manner.

Practice shows that in a majority of cases commercial rejects originate at a railcar's loading location, at the consigner. A large amount of formal documents are being drawn up on this. Well, and what do they provide? During 1985, for example, 1,865,379 formal documents like these were drawn up for the network. The enormous labor of thousands of workers was spent on this scribble! And what was the result? After finishing the inquiry it turned out that nearly 80 percent of the formal commercial documents don't perceive it as the fault of railway transportation workers.

Although the reorganization of all organizational operations that are aimed at eliminating misappropriations and other losses of national economic freight while it is being transported has already begun, it's also necessary to further strengthen labor and industrial discipline at all links that are associated with shipping and storing national economic production. It's necessary to take under particular supervision stations where all is not well with the protection of freight. We really don't have all that many of them at each railroad, and they're well known to everybody.

I want to emphasize that only the first steps have been taken in improving freight protection. And it's important to give increased attention to this important national matter at all railway transportation subunits.

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MARITIME AND RIVER FLEETS

BIRYUZA AUTOMATED SHIP NAVIGATION SYSTEM DETAILED

Moscow MORSKOY FLOT in Russian No 3, Mar 86 pp 34-37

[Article by V. Antonenko, A. Koshevoy and A. Yakushenkov, candidates of technical sciences: "Biryuza" — A New System for the Overall Automation of Ship Navigation"]

[Text] State tests of the new Biryuza system for the overall automation of ship navigation processes, which is intended for vessels in the maritime fleet, were completed at the beginning of 1985.

This system insures the continuous automatic calculation and plotting of a vessel's path on a map; the determination of current coordinates based on data from diverse determinations and — on the whole -- taken at different times; automatic corrections based on received read-out coordinates; automatic control of the vessel's movement according to the course and assigned itinerary; automatic solutions to the tasks of averting collisions; monitoring the seaworthiness and strength characteristics of the vessel for the given distribution of cargo, supplies and ballast; and the automatic recording of navigational data.

The Biryuza system is based on a modular construction principle with the capability of flexibly attaching modules conforming to different types of vessels. This distinguishes it from previous generation systems where the principle of centralized control based on a single multipurpose electronic computer, which was universal in its structure, was used. In the Biryuza system, the processing of navigational information and the control of the vessel are carried out using modern microprocessor equipment.

Tsikada and Tranzit satellite navigation system (SNS) receivers, phase and impulse-phase radio navigation system (RNS) receiver displays, and modern systems for position indication and for measuring the speed of the vessel and the angular velocity of its turning are used as navigational information data receivers in the system. Part of the above-listed instruments were developed for the first time, including the KM-145 remote magnetic compass the Gals turning speed meter, the radio-doppler log (RDL), and the Tranzit SNS-Biryuza SN receiver. The RNS receiver displays were re-worked into a desk design. One of the main sources of information for controlling the vessel while sailing in constrained waters is the Briz-Ye automatic radar

plotting system (SARP) which is connected with the ship's radar and which has a mode for the automatic tracking of stationary reference points.

Two fundamentally new tasks have been realized in the Biryuza system: the automatic joint processing of the navigation information that arrives from different systems for determining locations and the automatic control of the vessel's movement, including stabilization on a direct course or in a given navigation channel and turning in accordance with a given program.

The combined processing of navigational measurements is based on a modern body of mathematics. As a result of the processing, the current geographical coordinates of the vessel, its velocity vector relative to the bottom and the drift parameters are calculated. This information is reflected on an electronic display and is used to plot the vessel's path on a map automatically.

Automatic control of the ship's movement is carried out while maintaining optimum conditions. The following have been selected as optimization criteria: on the open sea -- the economic criterion which contributes to minimizing losses of travel time and expenditures of fuel; and for constricted waters -- the accuracy criterion which insures minimizing the estimates of the vessel's lateral displacement from the given track. The automatic measurement of the vessel's course is accomplished by the given angular velocity or the given curvature of the path with minimum overshooting when adopting a new course.

The controlling actions for realizing the mentioned conditions are formed in the information and control complex of the Biryuza system based on continuously arriving data about the course and position of the ship's center of gravity with relation to the assigned path and angular velocity of the vessel. Lateral displacement is calculated based on the results of the joint processing of the navigation measurements.

The route of the voyage is set using the coordinates of the turning points and the width of the navigation channel (traffic lanes) which are introduced manually.

The system includes six modules (Fig. 1): navigation, ship handling, monitoring of seaworthiness and strength characteristics, preventing collisions, recording, and information control which is a component part of the navigation module in the complete set.

The Biryuza-IU information control module contains a multi-processor computing system which is common to the Biryuza-S and Biryuza-R modules. This system was built using a series 580 microprocessor unit (MPK) which has a high degree of integration and a large collection of interface circuit designs. New-series large integrated circuits are used to store the programs and data. The receiver display of the Biryuza-SN satellite navigation system has been implemented using this same MPK.

A two-processor computer system is used in the Biryuza-IU set. The first processor handles the tasks of inputting and converting the data from the keyboard, the exchange with the teletype and the initiation of tasks to be

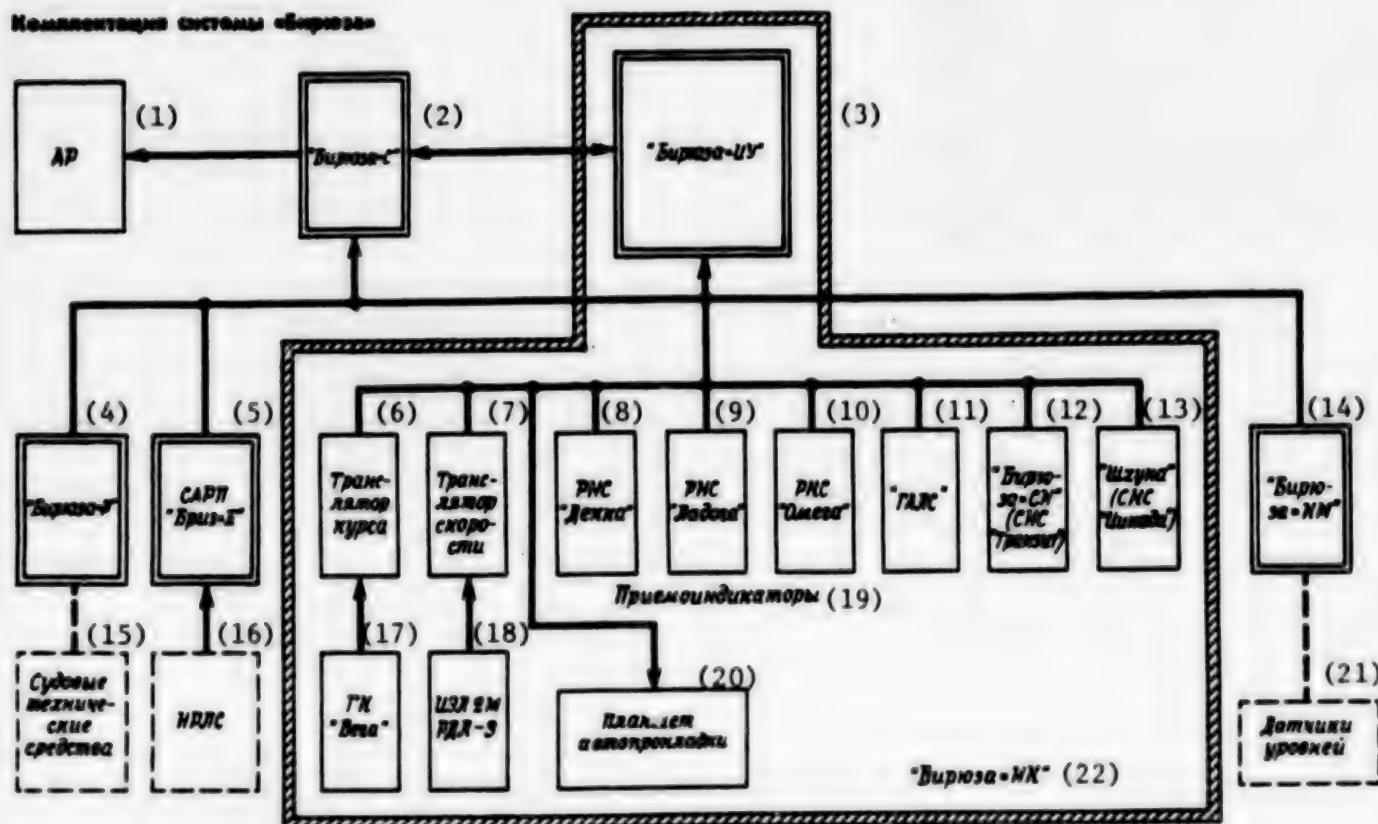


Figure 1. Complete Schematic of the Biryuza System

Key:

- | | |
|--------------------|------------------------------|
| 1. AR | 12. Biryuza-SN (Tranzit SNS) |
| 2. Biryuza-S | 13. Shkhuna (Tsikada SNS) |
| 3. Biryuza-IU | 14. Biryuza-KM |
| 4. Biryuza-R | 15. Vessel technical systems |
| 5. Briz-Ye SARP | 16. NRLS |
| 6. Course compiler | 17. Vega GK |
| 7. Speed compiler | 18. TsEL 2M RDL-3 |
| 8. Dekka RNC | 19. Receiver displays |
| 9. Ladoga RNC | 20. Automatic plotting board |
| 10. Omega RNC | 21. Level gauges |
| 11. GALS | 22. Biryuza-NK |

solved by the second processor. The second processor solves arithmetical tasks on request of the first processor and reflects the results of their solution.

With this distribution of tasks, the size of the general standard programs of the two processors is minimal and the procedure for tapping the memory of either processor is simplified. Exceeding addresses is prevented by the rational distribution of the address field. When either processor breaks down the system shifts to working with the other. This is displayed externally

as a slowing down in reaction to control from the panel. All of this makes for increased survivability of the system as a whole. The Biryuza-IU module also contains an electronic display and an instrument for mating with the analog information sensing element. The Series 585 MPK is used as a high-speed digital-to-analog converter.

The Biryuza-S ship-handling module has been designed in the form of a standard section that is mounted near the front bulkhead of the navigation bridge. In an informational respect, this module duplicates the navigation console, i.e., it permits all of the navigation information, which can be required by the navigator, to be reflected on an electronic display. The main purpose of the module is to solve tasks concerning the control of the vessel. The route of the voyage, course, angular velocity of a turn, and a number of other ship parameters, which are required to calculate the optimum feedback factor coefficients in the law of controlling a ship's movement, are inputted from its console.

The Biryuza-S module is a digital regulator that insures optimum control during the vessel's movement for course, assigned navigation channel and turning, through the circuits of the organic automatic steering device. The following are presented on the display: time, assigned and actual course, the ship's lateral displacement from the assigned line of the track, and the distance remaining to the turning point considering the reaction of the vessel to the rudder's effect and the geometry of the turn. A signaling system has been provided for the vessel's approach to the edge of the assigned traffic lane and also for the vessel's approach to the calculated turning point. The digital control can be switched to the organic one in order to improve reliability.

The module for averting collisions (the Briz-Ye SARP) performs a dual function. In the autonomous mode, it insures the automatic tracking of up to 20 vessels, the continuous determination of the parameters of their movement and the forecasting of their positions, and an evaluation of the danger of the situation for the assigned values for time and the distance of the closest approach. It also permits the maneuvering of one's own ship in course or speed to diverge from the dangerous vessel, to be played. In complex with the Biryuza-IU module, the Brez-Ye SARP insures the determination of the position of one's own ship in accordance with stationary radio-locator reference points. The coordinates of the reference points are introduced in advance into the memory of the Biryuza-IU module and are transmitted to the SARP for the automatic transference of the detection gate to the zone of the reference points' location. After the reference points (up to three) are automatically locked onto, their coordinates are automatically transmitted from the SARP to the Biryuza-IU module where they are compared with those stored in the memory. As a result, the information for determining the position of one's vessel according to radial location observations is produced. Subsequent locking onto and tracking of the inputted reference points are carried out automatically during the vessel's movement. Thus, the vessel's coordinates are produced continuously.

The Briz-R recording module together with the Biryuza-IY information control module insures the recording of the results of the solutions to navigation

tasks and the parameters of the vessels that are being tracked by the SARP and the recording (when tied in to ship's time) of the condition of 127 sensors in the ship's technical systems on teletype tape. The module records a number of events which have occurred over the course of the last hour (periodic recording), at the time of an inquiry (recording in accordance with the inquiry) and during a maneuver by the vessel in course or speed. The amount of the recorded information corresponds to the demands placed on the ship's log and permits the navigation situation during the time of interest to be completely reconstructed.

The Biryuza-KM module provides for planning cargo operations and monitoring the seaworthiness and strength characteristics of the vessel. The presence of its own computer equipment and the absence of communications with other modules permit it to be placed in the ship's cargo operations control room, the office of the cargo assistant or in some other special place. The Biryuza-KM module carries out the automatic compilation and inspection of the cargo plan that was proposed by the port; the calculation and monitoring of the seaworthiness and strength characteristic of the vessel for the assigned distribution of cargo, supplies and ballast; the determination of stability using the listing method; and the documentation of information on the cargo and the results of solving tasks. The Elektronika-81 microcomputer, which is programly compatible with the SM-4 electronic computer, is used in the module. This was done so as to insure compatibility with the programs of the Port automated control system that is being developed and to unify the compilation of cargo plans on a vessel and on shore.

Figure 4 shows the external appearance of the navigation console in the Biryuza system. Besides the equipment that is included in the navigation console and the ship-handling console, a character panel has been mounted on the navigation bridge, on which information for the helmsman under manual control conditions is displayed. Besides the assigned course, the panel reflects the ship's lateral displacement from the assigned path and its angular velocity.

The state tests of the Biryuza system were conducted on the Professor Ukhov training and production vessel during trips from Leningrad to ports in Finland, Greece and the FRG under various weather conditions (including seas up to 8) and vessel loadings.

The precise characteristics of the system for navigation and ship control tasks were determined during the tests. The nature of the trip permitted the system to be inspected in the zones of effect of all radio-location systems being used. Isolated light houses, buoys and coastal features were used as reference points for radar observations.

The main attention during the tests was paid to control tasks because, on the one hand, they had been automated for the first time in the Biryuza system and, on the other hand, automatic control of a vessel's movement on an assigned route is a synthetic problem in which navigation problems form a component part. Thus, the appraisal of the quality of controlling the vessel simultaneously describes the effectiveness of the solution of navigational problems.

The testing of the system under the conditions of stabilizing the vessel on a course was conducted in the Baltic Sea and the Bay of Biscay with oncoming and following seas. During this, the quality of control with the Biryuza system and the organic AR automatic steering system was compared under identical conditions. The settings of the organic automatic steering system were set by the assistant watch officers using their own experience. The angles of the vessel's deviation from the course, the angular velocity of the yawing and the angles of the rudder's laying were recorded using a series of 250-300 measurements. The results were processed on the microcomputer. It was determined that the quality of the ship's stabilization on the heading essentially depends on the feedback factor. A small dependence on the vessel's parameters of constant time and rudder amplification factor was observed at the same time. The latter is possibly explained by the peculiarities of the Professor Ukhov training and production vessel, which is related to the class of vessels with a large reserve of heading stability.

With optimum values for the feedback factor, they managed in all cases to achieve higher quality in control using the Biryuza system in comparison with the organic automatic steering system. Thus, with seas of 2-3 and a wind of seven meters per second from the stern course angle, the effectiveness of control using the Biryuza system was almost twofold higher when compared with the organic control. At the same time, the number of rudder layings is decreased considerably (two-threefold) per unit of time. It was established that the Gals angular velocity meter insures the vessel's stabilization on a heading with seas up to 6-7.

The task of stabilizing the vessel on the assigned path was checked using different information sensors, including the Pirs-1M RNS receiver display, the Briz-Ye SARP (in the isolated lighthouse, buoy and coastal feature tracking mode) and SNS receivers. The operation of the Biryuza system was checked independently with the autonomous use of sensors and with the joint processing of navigation meters. The tests were conducted while passing through the Great Belt Straits, the English Channel and the Strait of Gibraltar and in the open ocean in various coverage zones of the Dekka RNS and at various times of day.

During the tests, the vessel's lateral displacement from the assigned track, the deviation of the vessel from the heading and the angles of the rudder's laying were recorded using series of 200-300 readings. Estimates of the above-mentioned values and graphs of their changes over time were obtained as a result of processing them on the microcomputer. The average quadratic deviations of lateral displacement and heading, which were obtained under seas of up to 5-6 and a speed of 15 knots, are shown in the table.

The information in the table does not take into account systematic errors in the navigational measurements.

The results of the tests testify to the fact that the Dekka phased system (in the joint processing of data mode) and radar systems with the availability of point references provide the greatest accuracy in keeping the vessel in the assigned traffic lane.

<u>System used</u>	<u>Average quadratic deviation</u>	
	<u>Lateral deviation, M</u>	<u>Course degree</u>
Dekka RNS in autonomous mode, day	31.1	2.4
Dekka RNS in the joint processing reckoning systems mode, day	9.96	1.64
Briz-YE SARP with automatic locking on point reference points	15.8	1.3
Briz-YE SARP with automatic locking on coastal features	81.9	5.2

The use of the Tsikada and Tranzit satellite systems to solve the tasks being examined was of little effect in view of the insufficient accuracy of these systems and the large discreteness of the navigational determinations. This is one of the arguments in favor of using in the fleet the Glonass and Navstar continuous-action satellite navigational systems.

The equipment of the Biryuza system worked faultlessly during the test throughout the entire 1,100-hour trip.

Based on the results of the tests, the Biryuza system is recommended for use as standard ship equipment on vessels in the maritime fleet. It is expected that its introduction will assure a significant decrease in losses of steaming time and fuel expenditures and an increase in vessel navigational safety.

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MARITIME AND RIVER FLEETS

EFFECT OF DANUBE-DNIEPER CANAL PROJECT CONCERNS SHIPPERS

Moscow PRAVDA in Russian 24 Jun 86 p 2

[Article by V. Zagoruyko, rector of the Odessa Institute of Marine Fleet Engineers, professor, and P. Nikerov, pro-rector for Scientific Work, professor: "Across the Channel: Problems and Opinions"]

[Text] "Raise the quality of the technical-economic bases of construction...." The requirement of the Basic Directions for the Economic and Social Development of the Country, adopted by the 27th CPSU Congress, is involuntarily recalled when one becomes acquainted with the plan for forming the Dunay-Dnepr hydroeconomic complex. Is it being fulfilled?

It is difficult to dispute the value of this construction project and its important role in irrigating the agricultural arable lands in the south of the Ukraine and Moldavia. No matter how necessary this canal is for agriculture, however, it can cause a great deal of damage to the maritime fleet, river transport, the fishing industry and several other sectors. The most important task of the planners, and primarily the workers of the Kiev Planning and Research and Scientific Research Institute of Ukrainian Hydroeconomics should be, in our opinion, to reduce it to the minimum.

Unfortunately, this aspiration is not examined in the plan--at least, with respect to the major commercial fleet in the country and the ports of the Black Sea basin. Because of the circumstances that have evolved, the country's maritime transport is developing under conditions of a well-known disproportion. On the one hand--an extremely powerful fleet (fifth in the world). On the other--a relatively weak shore base. There are great losses due to the idle times of ships waiting for berths.

The plan proposed by Ukrigiprovodkhoz in essence deprives marine transport of any promise for development of the basin ports. They specify separating the Dnistrovskiy estuary and the Belgorod-Dnistrovskiy Port from the Black Sea. Permitting this means discarding the development of the "shore."

In accordance with today's technical-economic basis of the plan, the estuary, in its lower section, directly at the Tsaregradskiy Strait, is dammed. The water here is fresh, and the basin, separated from the sea, is used as an

accumulating reservoir. This decision causes many doubts. The canal runs along the seashore from the irrigated fields, and the water in the canal can be salinized. The experience of distilling Lake Sasyk has already shown the inefficiency of this. In addition, in the opinion of a number of organizations and scientists, the natural sand bar may be destroyed, with a sharp change in the hydrological conditions. Creating a freshwater basin in direct proximity to a resort zone will cause a noticeable deterioration in the curative and balneological conditions.

The dam will hamper the activity of the Belgorod-Dnistrovskiy Marine Fleet (cost of its fixed capital 20 million rubles, throughput capacity up to 2.5 million tons, collective--1200 persons). The main thing is: the possibility of future construction of a major marine commercial port with a cargo turnover of 100-135 million tons a year will be lost.

There is an alternative solution. It amounts to cutting off the estuary in its central section in the area of the Ovidiopol'skaya narrows. Here the link will improve transport connections in the south of the Ukraine and Moldavia: a main railroad and highway of any class and throughput capacity can be laid along it, which will reduce the unproductive run of these types of transport by 35-40 kilometers. The sanatorium-health resort zone will be freed of cargo traffic. Communication lines, power supply lines, water lines and other engineering lines to supply industrial enterprises and the people can be laid along the dam. In the lower part of the Dnistrovskiy estuary, a modern marine commercial port with a throughput capacity in the order of 100-135 million tons a year can be built. The natural conditions are such that enclosing structures can be eliminated and the volume of capital investments in the amount of about 400 million rubles can be cut, as compared with constructing a port of this capacity on the open shore. All of the port's shore structures will be erected on a newly formed territory, which will make it possible to preserve fully the valuable agricultural fields, as well as the health resort-sanatorium zone. Through industrial construction, it can be provided with engineering lines and transport connections. Finally, the length of the dam will be lessened and there will no longer be a need to construct a sluice to let large-tonnage marine vessels through and to raise the territory of the existing Belgorod-Dnistrovskiy Marine Port.

We particularly emphasize the need to preserve the lower part of the estuary for the new port. Of 16 sites examined, it is this precise place that proved to be the most favorable for it. Such a port is extremely necessary on the Black Sea. In the last few years a queue of 120-150 large-tonnage marine vessels waiting for a mooring place has become a customary phenomenon here. The downtimes of vessels waiting for processing in 1983 was 16,300 ship-days, and in 1984--15,700. This corresponds to yearly operational losses in the order of 75-80 million rubles. After all, the cargo turnover of ports in the southern USSR is consistently growing, from year to year.

The shortage of harbor wharves on the Black Sea is tremendous. The length of the harbor wharves for its largest ports today are in Ilichevsk--five kilometers, in Odessa--five again and in Novorossiysk--seven. Let us remember, the length of the harbor wharves in Antwerp is 97 kilometers, in London--69 and in Hamburg--60.

Now, as for cutting off the Dneprovsko-Bugskiy estuary. At the concluding stage of development of the engineering plan for the hydrosystem, out of the numerous preliminary versions, two were retained: the first--by means of a non-overflow dam, in accordance with the planning work of Ukrgeoprovodkhoz, and the second--narrowing down Kinburnskiy Sound to a width of 500 meters, without building a dam.

From the standpoint of the Ministry of the Maritime Fleet, the Ministry of the Shipbuilding Industry and a number of other departments, as well as in the interests of nature conservation, the most acceptable is undoubtedly the narrowing variant. It creates practically no obstacles at all for navigation. Unfortunately, it is being rejected by Ukrgeoprovodkhoz, because it leads to salinization of the Dnepro-Bugskiy estuary. Even the version with the non-overflow dam, however, has many substantial shortcomings, which will create serious hazards for shipping and the interests of environmental conservation.

It appears that there must once again be a critical examination of the formation of the hydrosystem, in which a spillway dam is placed between the adjacent filaments in inadmissible proximity to the zones where the ships approach the locks. This inevitably summons up the occurrence of dangerous disruptive currents and will create a threat to emergency loading of the vessels, for the construction of the lock, and at high tide makes sluicing generally impossible. The currents will be dangerous not only for shipping, but also for the guide-mooring and other structures being erected here, washing away their foundations. With the onset of the ice flow, sluicing will be hampered or even made impossible, also in connection with the fact that the flows turning toward the spillway section of the dam will create a herd of ice masses.

Lastly, and no less important, concentrating in one place an eight-kilometer dam for all the structures through which the water run-off from the estuary into the sea will be carried out does not meet the requirements of maintaining the sanitary-biological conditions for a reservoir. After all, the principal masses of blue-green algae, in the "flowering" period of the water (July-September) are concentrated in the southern part of the reservoir--in the opposite direction from where the water is discharged.

The shortcomings noted possibly stem from the planners trying to reduce the initial construction expenditures. This price reduction, however, has nothing to do with the economy and efficiency of the complex being constructed. It cannot help but lead, on the one hand, to a serious rise in the operating expenses for its content, and on the other--to a substantial increase in the idle times of ships, a reduction of navigation safety, a rise in the number of emergency situations in navigation and, no less important, to the deterioration of the sanitary-biological conditions of the estuary.

An alternate proposal was put forth by our institute. It requires no additional engineering surveys or research, and preserves unchanged the accepted location of the dam and right-bank placement of the ship throughput structures, as well as the main structural solutions. Through local rearrangement and structural changes, relatively non-labor-intensive in the planning, of certain elements, the cost of building the ship throughput is reduced by over 20 million rubles.

These proposals were reviewed and approved by major organizations and specialists in the field of water transport hydrotechnology and sluice building, as well as in USSR Gosplan.

It would seem that the authoritative responses should have made the UkrSSR Ministry of Land Reclamation and Water Resources and Ukrigiprovodkhoz pay more attention to the needs of maritime transport. The opposite happened, however. In November of last year the UkrSSR Ministry of Land Reclamation and Water Resources turned to the Ministry of the Maritime Fleet with a new proposal--to reduce by four meters the depth at the ramps of the planned sea sluices. Thus the promise for development of shipping on one of the most active maritime routes will be cut off....

It is absolutely necessary to solve the problems of water resources for the southern Ukraine. Any problems should be solved in a comprehensive manner, however, on the basis of the developmental promises of all branches of the national economy, but in no way against the interests of just one of them.

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MARITIME AND RIVER FLEETS

FAR EAST SHIPPERS FACE LIGHTER SHIP PROCESSING PROBLEMS

Moscow VODNYY TRANSPORT in Russian 5 Jun 86 p 2

[Article by S. Zelmanov, senior scientific associate of the Far East Branch of the Central Scientific Research Institute of the Maritime Fleet, candidate in Technical Sciences: "Attention: Lighter Carriers ..."]

[Text] The lighter carrier Aleksey Kosygin has been operating for two years in the Far East Shipping Company. The "biorhythms" of the lighter carrier system have grown solidly into an economic mechanism for the Far East region. Specialists, however, more and more often pose the most important question: How can the operational efficiency of the TTS [probably--Transport-Technological System] be increased? What is preventing it?

The Aleksey Kosygin lowers up to three lighters per hour into the water. With their average load being 300 tons netto, this ensures a processing intensiveness of 15,600 tons of general cargo a day. On the run the lighter carrier transports 82 lighters--24,600 tons! With normal labor organization on the line, in 150 days of sailing, with a round trip of 21 days, the lighter carrier makes seven runs and transports 276,000 tons of cargo.

How does one link up the logic of mathematical computations with the logic of the production process? Let us take the technical aspect of the matter. A motor ship is unique with respect to equipment. A lighter weighing 465 tons is automatically taken hold of from the water to the spreader, is raised to a height of 27 meters and automatically released into the hold. At the same time the crane operator merely sets up the lighter's address on the keyboard and the ship's computer instantly calculates the draft, trim and strength of the motor ship during loading and unloading. Time study of the crane operation made on the run showed that its technical potentials are 96 percent utilized.

The seamen also understand something else--improving the equipment is tested by practical work. It proved that there must be a cargo port in the stern to let people down into a floating lighter. There must be hydraulic shock absorbers in the catchers on the cantilevers instead of wooden linings, and the spreader must be modernized. The additional work does not require large expenditures and can be done at ship repair plants of the Far East Shipping Company.

In striving for maximum technological simplicity, minimum weight and a low price for the lighters, the ship builders have made them hazardous to operate (without efficient guard railings, and with unsuitable bilge access holes and docking winches). In settling, the lighters, with their sharp edges sometimes make holes in each other if there are no reliable and basic fenders. The simplicity turns into operational difficulties and often into damage to the cargo. What is to be done? Our suggestions, directed to DVMP [Far East Shipping Company], are not even examined at the technical council.

Isn't this really a general problem--to cut strips out of the rubber used to make hatch covers tight and make layered, permanent fenders?

It appears that even this is not the main thing. The organization of the system itself must be rearranged. We have already grown accustomed to the fact that the cargo prepared for the harbor loading and unloading should be processed, at any price. Just what is the price?

When, at the port center of Oktyabrskiy, the fishermen took lighters loaded with fish out to the roadstead at night, the ship should have taken them on board, or else the highly perishable goods would be wasted. Only by a miracle, in tremendously choppy waters, were they not broken against the cantilevers of the cranes, when the spreader with the lighter went under the counter of the stern and was caught there at the overhang of the guide stanchion. Hundreds of miles from the next port, in the autumn Okhotsk Sea, the crane could be put out of order, and there were 70 lighters on board. How could they take them off then?

They have avoided accidents. But where is the guarantee that the story will not be retold?

The work of lighter carriers in the open roadsteads at Ust-Kamchatsk, Beringovskiy, Pakhacha and Oktyabrskiy must not be considered the rule. It is expedient to delineate ports of call with enclosed inlets--Ezvekinot, Petropavlovsk-Kamchatsk, Provideniya and Vladivostok--and to load the lighters by feeder lighter carriers equipped with an aft hoisting platform.

Do the production workers take this opinion into account? There is no doubt of the expediency of our version. Yet, there is nothing specific here, because there is no feeder lighter carrier. There will be, but only by 1988. Moreover, it is not designed for loading in shallow-water ports and cannot even enter rivers. This very ship's crane has, naturally, the same limitations for choppy water during transfer of the lighters.

The technical proposal which we developed specifies a version of a lighter carrier-catamaran for eight lighters with a small draft and with the ability to take the lighters on deck and to tow them. This sort of ship is capable of replacing all the tugs at the Port of Vladivostok, and between approaches of the lighter carriers it will serve as a settling-accumulation base, where lighter carriers can be repaired and inspected. It can, let us assume, supply lighters from Posyet to Vladivostok or from Provideniye to Anadyr. Estimates show that three "little ones" will give the effect of at least 4 million rubles a year.

The shipbuilding budget, however, is not elastic--there must be additional capital investments. Where can one get them? The Nakhodka Ship Repair Yard produces a so-called lighter tug of the Bulat type. A half million rubles were spent to build the first one. The tug, however, in the opinion of the sailors, does not stand up to criticism of any kind--there is no maneuverability, it is low-powered and is slow to reverse. Is it really businesslike to put money in an unpromising product?

One more thing. The work on the line needs rearrangement and organization. Downtimes of a lighter carrier caused by many hours of filling out documents are inadmissible. The legislative intersectorial rules, obliging ships of this type to be processed first, must be formulated. The captain himself should determine where and under what conditions to take on cargo, relatively adjusting an inexpensive port fleet to the interests of the lighter carrier, and not vice-versa.

The question of forming a settling-accumulation base in Petropavlovsk-Kamchatsk, Egvekinot or Provideniye has become urgent. The harbor wharves for the lighter carriers must be expanded. For example, at the Port of Vladivostok, deep-water berths are used to process them. It is an enforced measure.

No one today, probably, dares to call the lighter carrier TTS a blind alley of technical progress. No one solves the above-mentioned problems at one stroke. The system, however, just as any developing, productive organism, requires an expansion of the radius of its economic efficiency.

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PORTS AND TRANSSHIPMENT CENTERS

OFFICIAL URGES TRANSSHIPPING CENTER COORDINATING BODY

Moscow VODNYY TRANSPORT in Russian 8 Apr 86 p 2

[Article by L. Paladich, administration chief, USSR Ministry of the Maritime Fleet, under the "Problems and Conclusions" rubric: "Transport Control is Needed"]

[Text] Expediting freight delivery to recipients does not depend solely upon transport means' speed of movement at sea, on the railroad, or on the highway. Indeed, the main delays today take place at the junctions of freight owner and freight transporter, and at the junction of different forms of transport at those points where departmental interests of the several parties clash. For example, freight releasing and receiving in the maritime ports.

In the loading of import goods in maritime ports, workers of two departments--the maritime port and the railroad--keep tally; and in the transshipment of imported food cargoes by the direct mode, shipboard to railroad car--as many as four departments: a Chamber of Commerce and Industry expert, the ship's tallyman, the port's tallyman, and the railroad's freight agent. Such departmental subordination does not provide for the freight's proper preservation, and hinders full utilization of the capabilities of new, highly productive transport-technology systems. Each of the parties subjectively approaches determination of the quantity and quality of the freight and the condition of its containers and packaging. When resolving any doubts, the parties start to think first of all, not about the actual quantity of the freight and its most rapid delivery to the consumers, but about not turning up with shortages of goods or freight in damaged packaging themselves.

As a result, surpluses are formed at shipping and destination points (and at the other end, correspondingly--shortages), and there often arise ungrounded refusals to accept on the railroad goods arriving, for example, in the packaging traditional for foreign suppliers but not entirely customary for us. Storage areas are overfilled, and valuable materials deteriorate in storage. Deliveries of equipment and materials to the national economy are delayed, the supplying of consumer goods to the population worsens, and such a situation negatively affects fulfillment of USSR Gosbank [State Bank] cash plans.

The situation is aggravated further by the fact that, as a rule, there are too few tallymen and freight agents in the shipping companies and maritime ports and at the railroad stations. This is linked to the nature of their work and wages. Some enterprises are staffed with this category of workers by 30-75 percent in all.

To improve the receiving and releasing of import freight in the maritime ports, to increase objectivity in its tallying, and, in the final analysis, to expedite its delivery to recipients, the Ministry of the Maritime Fleet has proposed a step that would seem to be entirely beneficial from the national economy point of view. Create an independent (extradepartmental) "Transkontrol" ["Transport Control"] organization at transport centers, based on the numerical strength and wage fund of the freight-tallying workers of the shipping companies, ports, and railroad stations. It would be guided in its activity, and in providing its conclusions about the condition of the freight and its quantity, only by criteria of objectivity and national economic benefit. Its appraisals would be final for all interested parties, and would permit avoiding the effects of departmental interests when transferring freight from one form of transport to another. Moreover, through an overall wage-fund saving, such an organization should be able to provide a higher wage level to its workers.

Transferring freight control functions to the newly created organization need not change the principles of the transport enterprises' material responsibility for preservation of the freight being transported as called for by existing law and the standardized documents. The paying of the "Transkontrol" experts could be effected by the transport enterprises through special tariffs [rates], and, in the process, the experts' responsibility could be determined to the extent of actually proven fault.

To test the effectiveness and advisability of this measure, a proposal to conduct this economic experiment at the Leningrad Transport Center was approved at an All-Union conference to exchange experience in transport-center operation organized by the Leningrad party obkom [oblast committee] in April 1985. This would have permitted the enterprises included within the Leningrad Transport Center to reduce the number of workers engaged in tallying the receipt and release of freight from 426 to 250, with a wage-fund saving of about 300,000 rubles for just one center.

As for the full national economic benefit, it would have been substantially greater.

Would have been, unfortunately, because the experiment has never been carried out yet for one reason--so far there is no one to whom to transfer this proposed organization.

Of all the organizations taking part in receiving and releasing import freight, the only nondepartmental one is the Chamber of Commerce and Industry (TPP), the certifications of which, on freight quantity and quality, also are recognized by both foreign freight shippers and freight owners, something that is very important in defending a Soviet party's interest. With this in mind, it was proposed to subordinate "Transkontrol" to the TPP SSSR [USSR Chamber of Commerce and Industry] as early as 1982.

But the transport workers' initiative did not find understanding at the TPP. In its response of 18 April 1985, addressed to the Ministry of Foreign Trade, the Ministry of the Maritime Fleet, and the Ministry of Railways, First Deputy Chairman of the TPP SSSR Presidium V. Pletnev advised that "the chamber and its staff members effect control of the quantity and quality of goods for making settlements with foreign firms according to commissions from both Soviet and foreign organizations."

Well, once it is effecting control according to the orders of Soviet organizations, then it is, as they say, the authority--and on this premise the Morflot [maritime fleet] proceeded in advancing its proposal. The response's author conveys the sense of the TPP's functions rather narrowly in limiting their purpose to making settlements with foreign firms. This limitation is not in its charter, but apparently the argument was necessary in order to reach an absolutely unexpected conclusion: "The Ministry of the Maritime Fleet's proposal is unacceptable, and the chamber considers raising the question of transferring the tallyman service to the TPP (creating 'Transkontrol' under the TPP) illogical, inasmuch as the TPP's functions, approved by the directing organs [author inserts question mark] do not permit it to engage in intradepartmental [author inserts question mark] freight transfers."

The conclusion not only was unexpected, but also unconvincing, because it obviously was dictated by the TPP's lack of desire to take part in an experiment departing from the traditional form of actions and thought. I should like to say that, in fact, it is illogical to turn down proposals benefitting the state, furthering the expedition and integrity of freight transporting, and, consequently, intensifying national economy activity. The sore points, as we see them, are sore not just for the transport workers, and not so much for them as for their clients and, consequently, for virtually all sectors of the national economy without exception. Therefore, substantial increase in the effectiveness of transport work is impossible without proper mutual understanding on the part of freight shippers and receivers and those departments which can have an effect upon the country's entire common transport network. This is especially so because lower-level labor collectives are finding ways to solve this problem anyway, calling in the local TPP experts on a commercial basis to conduct the indicated operations. The results, just as should be expected, are favorable--reduction in commercial rejects, and expediting of ship processing.

Life today insistently places an even vaster task on the agenda--the creation of an extradepartmental agency (firm) for transport-expediting service to the national economy, which would permit putting the relations between freight owners and carriers, and between the different forms of transport, on a stable foundation. This is extremely necessary to provide for stable work planning by all forms of transport in the basic directions of both domestic and foreign carriages.

I should like the TPP SSSR to return anew to this matter, and revise its position on the proposal of the interdepartmental seminar in Leningrad, which would be a genuine contribution to implementation of 27th Party Congress decisions.

PORTS AND TRANSSHIPMENT CENTERS

UPDATE ON BAKU-KRASNOVODSK RAIL FERRY PERFORMANCE

Moscow GUDOK in Russian 15 May 86 p 1

[Article from Baku by GUDOK correspondent V. Dimitrov: "Railroad Cars Sail on the Caspian Sea"]

[Text] Carrying railroad cars across the Caspian Sea became commonplace long ago. Powerful diesel-electric motor ships, which, figuratively speaking, have connected the railroad tracks of the two seashores with a floating bridge, have been plying the Baku-Krasnovodsk Line for a quarter of a century. With the ferry crossing's activation, railroad cars began to deliver freight more quickly from the European part of the country and Transcaucasia to the Central Asian Republics and back. The crossing's initiators--the Sovetskiy Azerbaydzhhan, the Sovetskiy Turkmenistan, the Sovetskiy Uzbekistan, and others--rendered a truly invaluable service to the country's national economy, and they continue in working condition.

Over the years, the volumes of railroad-car carriages became greater and greater, but at the same time, carriage regularity also began to be disrupted. Railroad cars arriving at the Baku Freight Station often stood idle while waiting to be rolled onto the ships. Taking up the station's tracks, they limited maneuverability. At times, in an effort to alleviate the situation to some extent, trains subject to shipment to Krasnovodsk by sea were put back onto the adjacent North Caucasian Railroad in order to deliver them from there to the destination point by the circuitous route through Astrakhan. There also were times when the diesel-electric motor ships left the ferry landing incompletely loaded. All of this was resulting in additional transport costs.

But then, at the end of last year, new diesel-electric motor ships fitted out with up-to-date technical equipment arrived in the Caspian Sea. They went into operation at once. The Baku people dispatched up to seven or eight ferries in a single 24-hour day. They succeeded in doing this specifically because the ships that had arrived did not require preliminary railroad-car selection by weight characteristics. Their automatic anti-list [trimming] system eliminated the spending of time on operations to select railroad cars. Such an advantage cannot be overestimated.

The intensification of ferry carriages also fostered a joint MPS [Ministry of Railways] and Ministry of the Maritime Fleet instruction "On Measures to Increase Freight-Carriage Volumes on Caspian Sea Ferry-Crossing Ships." It clearly spelled out who had to do what, and when, in order to obtain the greatest benefit from the ferry crossing.

Port and railroad workers began to cooperate in a businesslike way. In particular, the railroad workers substantially reconstructed the ferry-landing railroad yard, and an electric interlocking system of switches is about to be put into operation on the newly laid tracks.

Right now the ferry complex is operating with good regularity. Whereas the railroad workers did not fulfill the program for dispatching transiting railroad cars in January (although, in comparison with January of last year, 665 units more of them were dispatched), the quarterly plan as a whole was overfulfilled. Now, in comparison with last year's first quarter, 3,727 more railroad cars have been dispatched. Idle standing of rolling stock has been reduced, as well, by 2.1 hours compared to the norm. In a word, the results are not bad at the moment.

However, there are unsolved problems here, too. The Baku Freight Station railroad workers, for example, consider that they need another diesel switch engine. They also say, and apparently not without grounds, that the sharply increased volume of work requires the personnel allowance for train assemblers and freight and baggage agents in the ferry yard to be increased. These problems likely will be solved within the Azerbaijan Railroad's administration.

Unquestionably, the station's collective also needs a firm monthly schedule of diesel-electric motor ship arrivals at the ferry landing. At present, the railroad workers find out about the arrival of ships during the 12 hours before their arrival, and this obviously is inadequate.

Fulfilling the specified plans demands ferry-carriage intensification by the transport workers. And that cooperation which always has helped the Baku Freight Station railroad workers, the port workers, and the seamen to solve the difficult problems will do them yeoman service in the 12th 5-Year Plan as well.

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PORTS AND TRANSSHIPMENT CENTERS

YAMBURG PORT DEVELOPMENT EFFORTS UNDER WAY

Port Facilities Constructed

Moscow RECHNOY TRANSPORT in Russian No 4, Apr 86 pp 39-41

[Article by N. Vinogradova under rubric "Construction Projects of the Five-Year Plan": "A Port in the Arctic"; capitalized passages published in boldface]

[Text] Considerable attention has been devoted in the Basic Directions for Economic and Social Development of the USSR for 1986-1990 and the period up to the year 2000 to implementation of the Energy Program of the USSR. The most significant role in increasing the reliability of the country's fuel base has been assigned to Western Siberia, where the development and assimilation of natural resources has been specified on the basis of production intensification and utilization of the achievements of scientific and technical progress. In accomplishing this task, an important role also belongs to river workers, who are taking an active part in the transport service of Western Siberia, particularly in delivering cargoes to the Yamburg gas deposits.

PURPOSE AND COMPOSITION OF THE PORT

Among the projects connected with the construction development and operation of the Yamburg gas deposits in the Arctic, a river port has been planned for mechanized processing of various cargoes: reinforced concrete components, metal pipe, lumber, petroleum products and other items delivered in river vessels from the ports of Omsk, Tobolsk, Tyumen, Surgut and Labytnangi. The estimated cargo turnover (according to the plan) is 606,000 tons of general cargo and 106,000 tons of petroleum products. The length of the berth front is 620 meters.

Taking into account the navigation conditions at sea and near the shore in this region and the traffic pattern, self-propelled vessels of the 1743 and 758-B designs, unpowered barges of the 16801 and 942M designs, and tankers of

the R-77 and 866M designs from the fleet of the Ob-Irtysh United Shipping Company are considered to be economically suitable for delivering (transporting) cargoes.

The port is situated on the right bank of the mouth of the Nyudyamongo-toyepoka River, which flows into the Gulf of Ob. Eight berths have been planned for the port: for unloading crated and individual-unit cargoes, general-purpose containers, pipe and equipment, and reinforced concrete components (two), and for receiving dry refuse and economic effluent and one for discharging petroleum products, which is located on a sediment-retaining seawall a safe distance from the other berths, as well as an experimental berth made of ice and soil for developing methods of building a berth from local materials.

Processing systems using domestic portal cranes of different hoisting capacity of 5.10/12.5 and 80/50 tons, as well as forklift trucks with hoisting capacity of 3 and 5 tons, have been recommended for cargo transfer operations. Trucks, truck tractors and trailers have been specified for internal port equipment. Six units with hoses (standpipes) have been installed on the berth for petroleum products to link the pipelines on the shore with the connecting pipe of the tankers' cargo systems.

Construction of open and enclosed storage areas for cargoes and household facilities for the port's workers has been stipulated in the plan.

The complex of production and auxiliary facilities includes repair and machine shops, a warehouse for material and technical supply, a communications center, and dispatching and personal service facilities. The block of administrative and personal service facilities includes rooms to accommodate the port administration and operations services, as well as a meeting hall, a medical station, dining room and rooms for everyday use [bytovki]. Buildings for a boiler room, a transformer substation, sewage and pumping stations, and other facilities are being provided in a block-unit version. The internal engineering networks include water, heating and electric power supply, as well as communications and warning devices. (Radio communication with Tyumen, Nadym, Labytnangi and Tazovskiy is planned.)

At the customer's request, the plan calls for construction of internal port railroad lines which will be used in the future for storing freight arriving by rail between navigation seasons, with the aim of sending it off to the Yamal Peninsula later.

The plan for construction of the Yamburg port was drafted by the Giprorechtrans [State Institute for Planning in River Transport] (chief engineer of the project is V. L. Rogovoy) at the order of the YuzhNIigiprogaz [probably Scientific Research Institute for the Planning of Gas Pipelines and Gas Industry Installations in Southern Regions] of the USSR Ministry of the Gas Industry--the general project planning organization for developing construction of the Yamburg gas deposits. The general construction organization is the Zapsibgidrostroy [probably Western Siberian Hydroelectric Construction] Trust of the USSR Ministry of Transport Construction.

Dredging operations for the approach channel and water area are being performed by the Irtysh Basin Waterway Administration, and the portal cranes are being installed by the Podvodorechstroy [Moscow Administration of Underwater Technical and Construction Operations of the RSFSR Ministry of the River Fleet].

TECHNICAL SOLUTIONS

Efficient and progressive technical solutions aimed at preserving the environment and nature of the Arctic form the basis for the layout and structures proposed for the port.

The construction area of the port is a section of the tundra, a marshy floodplain with lakes formed by alluvial and marine sediments in permafrost condition. The Gulf of Ob is characterized by complex wind and wave conditions, accompanied by high- and low-level surges. Intensive shifting (movement) of sediments and fluctuations of the water level in the river, where the natural depths are 0.5 to 1.2 meters, result from this. The movement of sediments is observed basically from north to south and back, that is, along the shore of the Gulf of Ob. In order to link the Gulf of Ob with the port water area, an artificial approach channel (1.3 kilometers long, 90 meters wide, and 4.35 meters in depth from the water level with 99 percent security) is being developed. The shallow sections of the Gulf of Ob and the mouth of the Nyudyamongo-toyepoka River are being widened and deepened during the navigation season with hydraulic dredges and in winter by dry excavation equipment for this purpose. The presence of permafrost soils on the navigation route requires that they be loosened beforehand by drilling and blasting during the winter. The overall volume of soil excavated is in excess of 1.2 million cubic meters.

With the aim of reducing sedimentation in the channel, the plan proposes two lengthwise sediment-retaining seawalls to fill the role of protective structures and breakwaters at the same time. During the course of drafting working drawings and analysis of the observations cited for sedimentation coming into the navigation channel, performed by the Giprorechtrans and the MGU [Moscow State University], it was proposed that one lengthwise seawall--the breakwater (in the north)--and lateral slots (on both sides of the channel) be constructed for catching (intercepting) the sediments. The calculations show that with this variation, sedimentation of the route will be reduced and the estimated cost for construction of the port will be lowered.

It is planned to install navigation markers on the head of the seawall.

Development of the deep water area near the berths involves lowering the natural elevations of the surface of the thawed ground and admitting large volumes of relatively warm water. This results in the warming up of the permafrost ground of the foundation, which is made up of very icy loams and clays which lose practically all their supporting capability when thawed. For this reason, in working out justifications and selecting designs for the

berths, the designers devoted most attention to the reliability and stability of the structures, taking into account the features of the geological formation of each section, as well as technological effectiveness in their erection.

In the course of planning the project, a patent search was conducted for structures of berth quays and methods of building them on permafrost for 30 years in various countries--the USSR, Canada, the United States, Sweden, and other countries. As the result of analyzing technical solutions and the materials of engineering surveys conducted by Giprorechtrans over short periods of time under difficult Arctic conditions, the design of the berths proposed was in the form of a single-anchor bulwark out of shortened metal tongue-and-groove of the Larsen U (16 XG steel) type with a thermal pile [termosvaya] filled with a refrigerant.

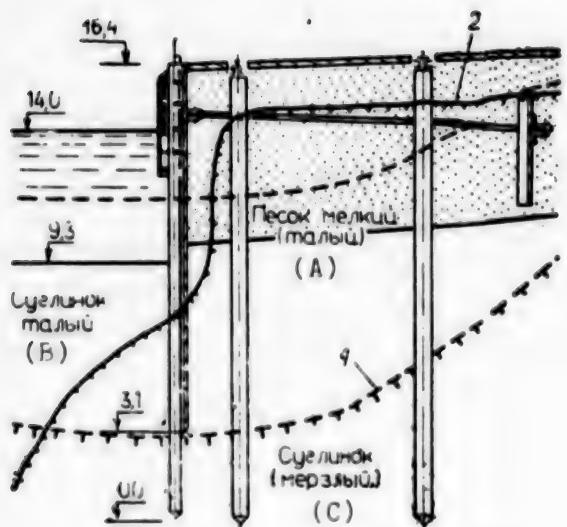
THE QUAY FOR DRY-CARGO BERTHS is being erected in the river bed in a section of thawed ground extended under the bed (6 to 12 meters deep) with underlying soils in a permafrost state.

To retain the frozen state in the substructure of the quay, a method of artificially cooling the ground with the aid of convective freezing devices (thermal piles), which consist simply of pipes capped from both ends, was recommended. The inside of the pipe is filled with a cooling agent (kerosene or Arctic fuel). Freezing of the ground takes place only in the winter as the result of heat transferred by the cooling agent from the warm ground substructure into the colder air. Convection of the cooling agent in the pipe is connected with its increase in density when it is cooled by the air. A special flow separator has been installed inside the thermal piles so that counterflows of the cooling agent are not mixed. Thermotechnical calculations have shown that use of the freezing devices mentioned significantly lessens the depth at which the permafrost soil thaws. Once installed in the body of the quay, the thermal piles do not require any special maintenance during operations.

Taking into account the complexity of embedding the grooved pile into the frozen ground, the depth at which it is sealed off is limited by the level of the top of the frozen ground and does not exceed 6.2 meters. In view of the fact that sealing off the grooved pile at the depth accepted is inadequate for the quay's stability, the thermal piles are being installed ahead of the grooved pile in bored holes. Having the lower end of the grooved pile bear up against freezing devices embedded in the frozen ground ensures stability for the quay. The distance between the thermal piles was approved at 1.68 meters and the depth at which they are embedded in the ground at 9.3 meters.

Deflecting devices are being incorporated to protect the thermal piles from damage by vessels. Another two rows of freezing devices are being installed in piles for the crane tracks which are cordoned off.

THE QUAY OF THE BERTH FOR DISCHARGING PETROLEUM PRODUCTS is situated on the head of the sediment-retaining seawall in the section where there are no permafrost soils and has been approved in the form of a double-row cofferdam out of metal grooved pile filled in with soil. The design approved has been



Конструкция набережной для сухогрузов

1 — граница вечномерзлых грунтов до установки термосвай; 2 — после установки термосвай

Structure of quay for dry cargoes

1. Limit of permafrost soils before installation of thermal piles
 2. After installation of thermal piles
- | | | |
|----------------------|---------------|----------------|
| A. Fine (light) sand | B. Light loam | C. Frozen loam |
|----------------------|---------------|----------------|



Freezing devices for the crane tracks

calculated for the effect of ice and wave action. The sediment-retaining seawall is also a protective structure which screens the ships being processed.

THE EXPERIMENTAL BERTH is designed for developing structures and methods of building with local construction materials (ice and sand) and may be utilized for transferring cargoes.

It consists of a core of ice protected on the water area side by plank facing, polyethylene film and a layer of sawdust mixed with sandy soil. Sandy soil is spread over the core and reinforced concrete slabs are set in place to ensure thermal insulation and weight to prevent it from floating up. Freezing devices also are being installed to increase the durability of the structures on the berth. The berth is being erected by means of freezing the ice core under the water.

Monitoring and testing equipment is being installed in all berths for the purpose of evaluating the actual temperature conditions of the soil in the foundations, as well as the deformation of the structures.

The port's buildings have been designed by taking into account the characteristics of the Arctic tundra. The foundations of heated buildings are built with an arrangement of cellars that are drafted through. Ceilings over the drafted cellars are in the form of a base plate of sheet steel and a heater of mineral-like tiles. It was proposed that the framework of the heated buildings be metal, and the walls be aluminum panels with efficient heating. Features of the heat and power systems, as well as drainage systems and sewage treatment structures in permafrost soils, also have been taken into consideration in the plan.

The method of laying out foundations for quays on permafrost soils proposed by the Giprorechtrans have been recommended for wide application in the construction of berths in regions of the Far North. It makes it possible to simplify the engineering of construction operations and shorten the periods of time to carry them out. The overall economic gain from the proposed version of quay construction, compared with traditional methods, amounts to over 5 million rubles.

Technical solutions for the berths of the Yamburg industrial port have been displayed at the thematic exhibition "Achievements by Inventors and Innovators in Transportation" in the "Transport USSR" pavilion of the VDNKh [Main Committee for Exhibition of Achievements of the National Economy]. The USSR VDNKh noted the innovation of the berth quay for dry-cargo vessels and the advanced nature of its technical solution, and awarded medals to the Giprorechtrans designers.

A commission of experts of the Ministry of the Gas Industry has approved the design of the first stage of the Yamburg industrial port with an evaluation of excellent.

FROM THE EDITORIAL STAFF

The port is being built and operated at the same time, but river transport remains the basic transport for delivering cargoes. In the 1985 navigation season, river workers brought in 1.39 million tons of cargo, under the plan for 1.35 million tons, for construction development at the deposits. They took the initiative and made test runs to transport 23 extra-large assemblies on pontoons from Tyumen to Yamburg, overcoming complicated navigation conditions in the Gulf of Ob.

In the 1986 navigation season, river workers have been set the task of nearly doubling the volume of cargo brought in (up to 2.5 million tons), primarily mineral construction materials from the Katvorozhskie deposits of the Sobi River and extra-large assemblies from the production bases of the Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises]. The socialist pledges of the river workers of the Ob-Irtysh United Shipping Line provide for extension of navigation in the early spring period by 20 days with the help of an icebreaker, the development of navigable routes in the direction of Yamburg, and establishment of security for cargoes and equipment.

In order to deliver cargoes continuously to the construction workers, it is necessary, as outlined by the plan, to put the startup complex of the port in operation (three berths extending for 237 meters) and to expand the approach channel and water area of the port within the boundaries of its full development. To bring out mineral construction materials (MSM) and equipment from temporary sites by the beginning of navigation, taking the short period of time for it into account, so that vessels can approach the berths without being impeded. At the same time, it is necessary to speed up the installation of the thermal piles to ensure normal depths and conditions for diesel vessels to approach and be processed at the berths.

The processing of mineral construction materials was not included in the engineering assignment for working out the design of the Yamburg industrial port, and for this reason, the port has no berths for unloading them and areas for storing them. At the same time, experience in construction development at deposits in the tundra has shown that significant amounts of mineral construction materials, which are basic at present in the port's cargo turnover, are necessary. In this navigation season, as in past ones, mineral construction materials are being unloaded from vessels by floating cranes onto banks that have not been built up and are under water. As a result of the high water and wave action, the mineral construction materials are being washed away into the approach channel and sections of the river mouth and bars, which leads to loss of them and obstruction of the navigable channel, requiring repeated dredging operations.

IT IS ADVISABLE THAT THE GENERAL PROJECT PLANNING ORGANIZATION YUZHNIIGIPROGAZ DEFINE THE ENGINEERING ASSIGNMENT FOR CONSTRUCTION OF THE PORT MORE PRECISELY FOR GIPRORCHTRANS, TAKING THE FUTURE DEVELOPMENT OF ITS CARGO TURNOVER INTO CONSIDERATION.

Basin Dredging Program

Moscow RECHNOY TRANSPORT in Russian No 4, Apr 86 pp 41-42

[Article by Engineer O. Strelchenya under rubric "Construction Projects of the Five-Year Plan": "So that Ships Can Come to Yamburg"]

[Text] When geologists opened up the Yamburg deposits, the only possible types of transport were helicopters and river vessels. For this reason, the first shipments--drilling equipment, all-terrain vehicles, portable housing timber--were delivered to this part of the Gulf of Ob on wind tides in shallow-draft diesel vessels and barges. The main obstacle on their route was the shallow-water bar and the unnavigable Nyudyamongo-toyepoka River.

The need for cargoes began to increase sharply with the development of the deposits, and river workers of the Irtysh Basin Waterway Administration were set the task of developing a channel and small water area where river barges could be processed. There was no dredging equipment of the "M" category in the basin waterway administration, and for that reason, at the suggestion of the former chief of the Salekhard technical section of the waterway, I. M. Kovrigin, the method of washing out the river bed with the propellers of a powerful diesel vessel was adopted. An increase in depth was rapidly brought about, but the gain was short-lived, since the soil remained on the edges of the channel and washed away into the cut with the very first storm. The work had to be done repeatedly. The presence of a waterway even such as this made it possible for shipping to bring in the first several thousand tons of cargo and unload them on the bank of the future port of Yamburg.

In 1982 an attempt was made to deepen the channel and water area with a DE-700 suction dredge. However, the dredge was damaged (the suction pipe frame and dredge were broken, and so forth) with the very first storm and it was towed away for repair. This experience confirmed that such vessels cannot be used for working permafrost soils because of the insufficient durability of working facilities. For this reason, an "Irtysh-525" multibucket hydraulic dredge was sent to Yamburg as early as the 1983 navigation season to develop the port's water area. Depths in the channel were maintained as before by washing away the soil with the propellers of a diesel vessel rated at 1,472 kilowatts (2,000 horsepower). The amount of cargo delivered by shipping exceeded 40,000 tons.

In 1983, based on the materials planned by Giprorechtrans, the route of the channel (the direction, depth and width) was substantiated and development was begun with the aid of engineering facilities for dredging. The navigable route created earlier turned out to be on the side and was used for ship passage to the berths while the hydraulic dredges worked on the basic channel, in order to decrease delays by the fleet for this reason.

The rate at which the Yamburg deposits have been developed have increased rapidly and requests for delivery of cargo by water already have reached hundreds of thousands of tons. Implementation of a large volume of operations was required in order to develop an approach channel 50 meters wide and over 300 centimeters deep and a water area which could accommodate cargo berths (on

the southern and northern banks) in 1984. Specialists of the Irtysh Basin Administration and the Salekhard and Tobolsk technical sections of the waterway analyzed the available experience and prepared the "Irtysh-528" and "Irtysh-531" for operations under severe conditions. These crews were headed by commanders Nikolay Nikolayevich Klyat and Aleksey Nikolayevich Kazeyev. Measures were outlined and coordinated to ensure reliable operation by vessels in the "O" category under maritime navigation conditions. However, the hydraulic dredges could begin dredging only after blasting operations on the route, that is, loosening of the soil cemented together by the permafrost and not thawed out for the short Arctic navigation season. These operations could only be fulfilled on schedule by the construction workers with the help of the Ministry of the River Fleet, the Interdepartmental Territorial Commission of the USSR Gosplan, and enterprises of the USSR Ministry of the Gas Industry and Ministry of Construction of Gas Industry Enterprises [Mingazstroy].

On 1 June 1984, under drift ice conditions, both multibucket hydraulic dredges were towed to their place of work, but the "M" class suction dredge Urengoy, with the immediate task of developing the lower part of the channel located in the open part of the bay, arrived under its own power.

The presence of ice created definite problems, but at the same time, it made it possible to begin operations sooner, to deepen part of the water area and the approach to it at a time when the northern part of the Gulf of Ob was covered with ice, and the momentum and height of the waves were minimal, even during a storm. When the gulf was cleared of ice it became possible to lead the dredges away to shelter in stormy weather.

N. A. Konev, deputy chief of the Salekhard technical section of the waterway, supervised the operations and maintained operational communications with workers of the shipping line building the port and the many other departments.

Under complicated conditions with constant ship movements on the narrow route, they proposed the best procedure for working the frozen soils: take off the thawed earth in thin layers 10-15 centimeters thick. This made it possible to avoid major damage to operating equipment on the dredge around underwater obstacles and frozen ground. The laying and relaying of leveling and butterfly cables was labor-intensive, since the motorized mechanism for laying it out cannot move in shallow water and along a dry bank. They found a solution, using tractors on the bank as an anchor. However, they had to drag heavy steel cables up to them themselves, along the strake in the water and swamp ooze. Under these conditions, correctness in selecting crews was once again confirmed. Engineers A. N. Kazeyev and N. N. Klyat demonstrated their organizational capabilities. In the 2 years of work, there was not one complaint from these ships and there were no cases of labor and production discipline violation.

At the same time, the crews found the opportunity to diversify their work: they organized sports competitions and hikes for berries and mushrooms, and watched films (on the narrow-film equipment with which both dredges were furnished).

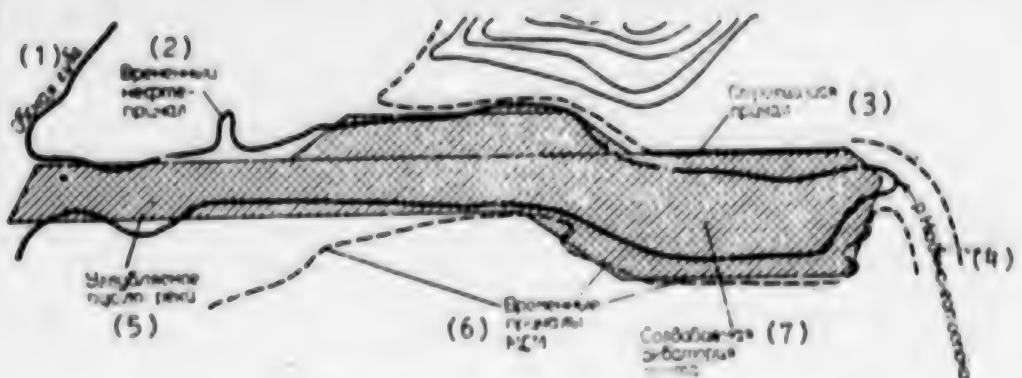


Схема канала и акватории порта

Diagram of the port channel and water area

1. Gulf of Ob
2. Temporary oil berth
3. Berth under construction
4. Hyudyamongo-toyepoka River
5. River bed being deepened
6. Temporary berths for mineral construction materials
7. Port water area being developed



Overall view of port (model)

The task set for the Irtysh BUP [Basin Waterway Administration] in 1984 was carried out successfully. The channel was developed and a water area was formed where ships have been unloaded at the berths. This made it possible to deliver more than 300,000 tons of essential cargoes to Yamburg.

In 1985, operations became even more complicated, since the target for cargo shipment was in excess of 1 million tons. They had to deepen the channel in order to ensure normal traffic capacity in winds which dropped the water level and develop the water area for additional berths. At the same time, they had to again remove the soil from territory having plus marks, which consequently is more susceptible to freezing. The management of the Irtysh administration had no doubts about sending those same crews to the work.

The teams of the dredges understood the importance of the dredging operations, and in the period between navigation seasons they analyzed their experience and prepared for the new navigation season. The management of the Tobolsk technical section of the waterway, to which the hydraulic dredges "Irtysh-531" and "Irtysh-528" and the suction dredge Urengoy were registered, manned the vessels despite personnel difficulties and provided them with spare parts, food, and so forth.

All the dredges arrived in Yamburg accompanied by icebreakers, and in spite of this, they stood idle for several days, since the ice conditions did not permit them to begin dredging. Unfortunately, the winter preparatory operations to loosen and take away the soil by construction workers of the Zapsibgidrostroy Trust of the USSR Ministry of Transport Construction were conducted poorly: there were many cofferdams consisting of frozen soil which did not lend themselves to working by the dredges.

Lack of coordination in operations and unwillingness to consider the crews' opinion led to a manmade delay in the periods for deepening, breakdowns of the dredges, a decrease in their productivity of up to 20 cubic meters per hour, and an extremely tense situation. Having surmounted all the difficulties, the waterway workers announced on 1 August that the berths were ready to receive the fleet for processing.

Taking the technology and experience in operations into account, the crews prepared the dredges for the 1986 navigation season, in which the tasks are even more complicated and essential: they have to widen the approach channel up to 90 meters since, with a width of 50 meters and intensive traffic by large-capacity ships, it is practically impossible to keep the buoys which mark the channel boundary secured, and they have to develop the second section of the port water area. However, work by construction workers of the Zapsibgidrostroy should precede this before the navigation season: breaking up and taking away the frozen soil up to the marks, which would make it possible for the dredges to begin dredging the route. Otherwise, based on the technology for excavation, the dredges will take one berth out of operation by deepening near another one, since the approaches will be spanned by cables. The loss of time in permitting the fleet to pass will be unjustifiably extensive for this reason.

In 1986, dredging operations will be continued by the same collectives, as well as by crews of the suction dredges Yavay and Yamal, with productivity of 4,000 cubic meters per hour. They will be deepening the approach channel in the open part of the bay, since they were designed for working soils in sections with shoreline and sea navigation conditions. It is possible that the problem of working with the bars in the gulf of the Ob and Taz Rivers will be resolved with the help of these dredges.

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PORTS AND TRANSSHIPMENT CENTERS

NEW TALLINN PORT CONSTRUCTION PROBLEMS HIGHLIGHTED

Rail Sector Concerns

Moscow GUDOK in Russian 10 Apr 86 p 1

[Article by L. Lyubimov, GUDOK correspondent, Tallin: "Take in the Slack"]

[Text] The first phase of the Novotallinskiy Port should begin operating by the end of the year. The assimilation of assets for the construction of the railroad projects at the port under construction reached 17 percent of the annual amount during the first two months. A total of 14 of them were for the underway complex.

It is necessary to point out that the plan had been lowered with a consideration for winter. During one of the critiques, V. Kolenikov, a representative of the client and deputy chief of the Baltic Railroad, pointed out that the builders had barely managed the minimum quota.

Winter is now behind us, however, and it is time for the builders to speed up the tempo but, alas, everything remains at the previous level. There are many reasons, but the main one is that there is no coordination; the directors of the Sevzaptransstroy [Northwest Transport Construction] Trust have settled down. The general contractor has already failed to participate twice this year in joint meetings to critique and plan the work. You see, it is his fault that the beginning of the construction of the compressor house is being delayed because of poor delivery of complete sets and that there is a shortage of structures for the all-electric switches-and-signals interlocking post at the port's classification yard. Work is being performed here, nevertheless, on a foundation pit in which to build the foundation of a three-story building with a complicated base. Specialists estimate that the all-electric switches-and-signals interlocking post will take another six months. What will remain for the installation and adjustment of the equipment and automatic equipment?

Not only the customer but also the executors are experiencing alarm over the timely commissioning of the post. SMP-675 [Construction Work Train-675] is trying to force the matter, but its directors do not know what the trust's reinforced concrete structure plant will deliver to them from the station of Mga on the October Railroad and when. The trust has also not solved the question of lighting masts at this same station.

Many problems are awaiting a solution in the higher department of the two ministries. The executors and customer have not received measures, which have been jointly approved by the deputy ministers (Ministry of Railways and Ministry of Transport Construction) to insure the commissioning of the projects under construction with directed periods for handing them over for installation and operation and with the suppliers responsible for material support. This, in turn, drags out the coordination of the work schedules of the numerous subcontractors.

Designers from Lengiprotrans [Leningrad State Transportation Design Institute] have been invited many times this year to Tallinn. The railroad's administration asked them to come to the March expanded critique. The designers, however, ignored all the requests. Because of this irresponsibility, the filling of the roadbed in the Tallinn hub was halted (the stretch from Laredi to the four-kilometer post). Here, the owner of the cable quite rightfully prohibited work -- a communications line is in the area of the filling of the roadbed. A design decision about removing it is required. The time frame established for Lengiprotrans by the minutes of the previous meeting was before ... 1 March. There is no clarity regarding signaling, interlocking, blocking and the planting of trees and shrubs on the territory adjacent to the station of Muuga. Estimates are absent. The time for issuing working documents for the temporary supplying of heat to the service and technical buildings at the station of Muuga has expired.

A. Petrov and other design authors, who are not exerting the necessary authority over construction, are behaving strangely.

A new problem has also arisen. The republic has not made its payment for its percentage participation in the building of the overpass. Because of this the USSR Stroybank is holding up the financing of the work that has already been started to build the overpass. The attitude of the directors of the Estonian Division is surprising. During the first quarter, they pledged to allot one and a half kilometers of old rails for laying on the line. Several telegraphed instructions arrived from the road's administration, but no reaction has followed.

The railroad's instructions about organizing telephone communications at the construction area of Muuga Station have not been implemented. For a long time, now, there has not been anyone in the division who is responsible for carrying out the work that has been placed on the customer. A great deal of equipment arrives at the projects, but there is no place not only to complete it but also to store it. Complicated automatic equipment lies under the open sky. It is not so simple to find a required item, unit and assembly. This can explain the respite of two days in the "window" for carrying over the high voltage line. It turned out only during the course of the work that the items, which were required for the line's suspension equipment, were missing. Since 1985, the main supply administration and the railroad have not been able to complete the project with equipment. In order to finish all of the projects provided in the underway complex without an assault, the general contractor, subcontractors and customer must jointly develop concrete measures and the main administration of the North and the West must establish directed periods in stages for their commissioning.

Shipping Sector Concerns

Moscow MORSKOY FLOT in Russian No 5, May 86 pp 27-29

[Article by S. Trizno, SOVETSKAYA ESTONIYA correspondent, under the rubric "Joint Correspondents' Station in the Novotallinskiy Port: SOVETSKAYA ESTONIYA-MORSKOY FLOT": "Concerns Before Start-Up"]

[Text] MORSKOY FLOT informed its readers approximately two years ago that a new gigantic port was to be built 20 Kilometers northeast of Tallinn and that the largest construction project in Estonia would be taking place. Work has been performed here for more than four years and it is possible to talk today about the outcome at the "finish line" -- the complex under construction should be commissioned at the end of this year.

The volume of work in the Bay of Muuga is enormous and the problems, which must be resolved, are very difficult. As often happens at large construction sites in which many contractors and subcontractors and dozens of organizations, administrations and trusts participate, you cannot avoid difficulties, overlapping and lack of coordination. A great number of questions arise even with the first acquaintanceship with the construction project.

For example, how will the port and its multimillion freight turnover "join" the railroad, what is being done to insure navigation safety, who is preparing cadres of port workers and how are they trained, how will they be provided with housing, how are they now planning to solve social and everyday questions? And many, many others.

Or take the following question. It is known from practice that life often stands still for a long time at construction projects after the underway complex has been received for operation. Yes, it is understandable: If the project is in order, it produces finished products for the operators. But will this port not be transformed after the commissioning of this complex into an "unfinished project" -- which has become a custom-- that must subsequently dawdle for dozens of years? There are already such misgivings now.

Another important problem. The port will handle refrigerated freight besides grain. Modern warehouses have been built for it by Finnish firms. On the other hand, however, it is well known (and this has been pointed out in the central press) that similar storehouses, which were constructed in Kaliningrad and Kherson, are dead because of the fact that

the shipping companies of the Ministry of the Maritime Fleet and the organizations of the Ministry of Foreign Trade "have for many years been shoving" the question of responsibility for the storage of perishable goods "into the mortar of departmental debate." Does the same fate await the enormous warehouses in the Novotallinskiy Port?

As we see, there are many questions. In order to obtain comprehensive answers to them, the editors of MORSKOY FLOT and the republic newspaper SOVETSKAYA ESTONIYA have decided to create a joint correspondents' point in the Novotallinskiy Port. It will periodically inform readers about the final stage of the work and report on both the achievements and the problems and errors of the builders. We hope to involve the directors of the construction site, subunits of the Ministry of the Maritime Fleet and the Estonian Shipping Company in the discussion.

The new rubric opens with two articles in which only part of the questions, which have been posed, is treated. The others are awaiting their turn.

This port is still not on the map. However, it is literally being born before our eyes. Four years ago, nothing reminded one that the largest maritime commercial port on the shores of the Soviet Baltic would grow here. Today, the outlines of its future buildings and structures are already clearly showing. Incidentally, several of the installations are being erected on the same place where the sea lapped until quite recently. A total of 150 hectares were reclaimed by hand in the bay of Muuga during a comparatively short time. The dirt for it (more than seven million cubic meters) was basically taken from the bottom of the bay. This permitted it to be deepened so that vessels with a dead weight up to 100,000 tons can moor at the berths of the new port. For comparison: the old Tallinn maritime port accepts a maximum of 10,000.

The first phase of the highly mechanized Novotallinskiy Port alone will be able to handle more than two times as much cargo as the existing one, and there will be twofold fewer people employed here. After the construction is completed, a giant, which will really compare with Illichevsk or Vostochnyy, will have grown on the bay.

Dozens of organizations and firms are participating in the building of the Tallinn hydraulic engineering complex. The customers are the Ministry of the Maritime Fleet and the Ministry of Railways. The developers of the basic documentation are the specialists from Lenmorniiiprojekt [Leningrad Maritime Design Scientific Research] and their helpers from the Estonproyekt [Estonian Design], Estpromprojekt [Estonian Industrial Design] and Estgiproselstroy [Estonian State Rural Design] institutes. The general contractors are the USSR Ministry of Transport Construction, which is represented by the Baltmorgidrostroy [Baltic Sea Maritime Construction](SU-423) and Sevzaptransstroy [Northwest

Transport Construction] (SMP-657) trusts, and also the USSR Ministry of Construction in the person of the Estonian SSR Ministry of Construction (the Promstroy [Industrial Construction] and Stroymekhanizatsiya [Construction and Mechanization] trusts and the Tallinn House-Building Combine).

The Finnish firms: Gruppa-Portal and EKE-Engineering, which are under an obligation to erect and hand over this year to the customer -- the Ministry of the Maritime Fleet -- the grain and refrigerated cargo transshipment complexes, are participating in the building of the main installations at Novotallinskiy Port. The West German firm [Byuler-Miag] is carrying out the delivery and installation of equipment for the grain complex.

At this largest construction project in Estonia the so-called parallel designing method is being used for the first time in the republic: Working drawings of each subsequent part of the project are prepared simultaneously with the building of the previous portion. This has permitted preparatory work to be carried out by the time the production forms and records have been approved and a shift to be made to the main construction task -- as they say -- without swings.

More than 150 million rubles of capital investments have been assimilated during the little more than four years of construction. A third of these have gone to construction and assembly work. Approximately 400 meters of berths have been built, dozens of kilometers of underground engineering networks have been laid, and the construction of the main projects, which are being built on the manually created dry land, is being completed.

A critical time has now arrived in the construction of Novotallinskiy Port. It is planned to hand over the complex, which is under construction, for operation at the end of December 1986. What does this include?

First, it is the entire berthing frontage, i.e., the pier with berths, and berths for grain and perishable cargo. Second, an elevator for 300,000 tons of grain and refrigerated warehouses. And third, sidings. But this is essentially the entire port -- the uninitiated reader could say. He would be wrong.

The port is not simply berths, at which vessels can moor, and warehouses for freight. It is a complicated complex of numerous structures, enterprises and services that are connected into a single inseparable whole with a dense network of engineering communications (communications, electricity, heat, water, and sewerage) and much, much more, thus, with the commissioning of the underway complex, something will still simply not exist and the main communications will operate according to a temporary schema.

The building of all installations is basically taking place on schedule. The targets for the amount of construction and installation work and for the commissioning of fixed capital have been overfulfilled.

If, however, we free ourselves of the magical influence of the general figures, then a picture is obtained that is not so favorable. The Baltmorgidrostoy's SU-423 and the Promstroy and Stroymekhanizatsiya trusts alone have underfulfilled the plan by more than two million rubles. Almost half of these arrears fall on the first of these organizations. SU-423 (a general contractor) was not able to complete construction work before the end of February on such a small project as the central distribution point (TsRP). Without it, it is impossible to satisfy the growing needs of the construction project for electricity in accordance with the permanent circuit. Power still arrives here over undependable overhead wires — and they often break down.

Perhaps the central distribution point is an unplanned project and that is why there is such a cool attitude toward it? However, a panel containing the socialist obligations of the SU-423 collective, on which the following is written in black and white: "Commission the central distribution point during the third quarter of 1985", has hung for a long time near the construction project's headquarters. The builders have repeatedly "adjusted" this promise, however, and in the end they did not fulfill it. The Baltmorgidrostoy Trust, which did not provide SU-423 with all the required material and equipment, is guilty of this situation.

The laying of the electrical cable nets on the port's territory (from the central distribution point to all users) was dragged out excessively through the fault of Sevzaelektromontazh [Northwest Electrical Installation Association] (the director of the work is A. Galkin). Sometimes they tried to shift the guilt for their negligence onto the weather and sometimes they vanished, generally speaking. The latest "evaporation" was fixed in January.

The Baltmorgidrostoy and Sevzapmorgidrostoy [Northwest Maritime Construction] trusts alone failed to assimilate almost a million rubles last year at one of the primary projects -- berths No 11, 12 and 13 at the refrigerated complex. This, incidentally, represents one quarter of the plan. Perhaps their leaders can blame only themselves and their own inability to organize the work for this. They had a sufficient amount of construction material, machinery and manpower at these complexes.

The arrears continue to grow this year. The delay in commissioning berths No 11, 12 and 13 is giving birth to new problems: the Finnish partners cannot begin constructing the ramps to the refrigerated complex because of the absence of the work frontage.

Quite a bit of justified criticism has been expressed about the organizations, which are involved in building Novotallinskiy Port, and addressed to the customer-- the Ministry of the Maritime Fleet. This organization has still not been able to arrange for the necessary completion of the equipment. The construction board of directors has delayed the delivery of equipment for the water-supply station and the waste-water pump house. The reason? The board of directors is experiencing difficulties with the revisions to the gate valves since it doesn't have them -- yes, and it shouldn't be the appropriate service. That is why no one seriously busies himself with the receipt of the equipment in point of fact.

If that is the way that you will have it, then its incompleteness or defective-ness will appear only during assembly when it is too late to submit a claim to the manufacturer or transport organization. The Estonian Shipping Company could provide considerable help to the board of directors, but it has already had a temporizing position for a long time. And the calculations for the project under construction are meanwhile taking place not for years as before but for months and weeks.

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PORTS AND TRANSSHIPMENT CENTERS

IMPROVEMENTS AT NIZHNEVARTOVSK PORT NOTED

Moscow VODNYY TRANSPORT in Russian 27 May 86 p 1

[Article from Nizhnevartovsk by E. Osokina, newspaper NEFTYANIK correspondent, and V. Delyukin, Ministry of the Petroleum Industry Press Center correspondent, under the "Western Siberia and Transport" rubric: "They Met It in Full Readiness"]

[Text] Nizhnevartovsk river transport workers, whose routes reach farther and farther every year, play an important part in the timely delivery of freight to the oil workers of Western Siberia. New docks [wharves, quays, or piers] also appear in each new shipping season. Last year--in the Belorusskiy drillers' and road builders' settlement. Then the river transport workers progressed along the Vakh River for the first time to a new construction site 375 kilometers away from Nizhnevartovsk. Now another dock will be added on this river--that of the (Yershovoye) Field, placed under industrial development this spring.

Last year about 2 million metric tons of national economy freight, most of it addressed to Minnefteprom [Ministry of the Petroleum Industry] enterprises, were shipped from Nizhnevartovsk Port. And in the 1986 shipping season freight carriages will increase; on the Vakh River, for example, by more than 100,000 metric tons. For the oil workers of (Khokhryakovsk) Field, and to Belorusskiy Settlement, 65,000 metric tons of gravel, 35,000 metric tons of slag, and about 7,000 metric tons of oil-industry equipment will be shipped.

This year, for the first time, the river transport workers will deliver 17,000 metric tons of precast reinforced-concrete structural elements for apartment-house construction to Belorusskiy. To (Yershovoye) Field, 75,000 metric tons of various freight will be delivered.

"The growth in carriages to the oil fields," says A. Baranov, chief enterprise dispatcher, "will take place through substantial redistribution of carriage volumes. Last year, for example, we delivered 1.5 million metric tons of sand for Nizhnevartovsk's needs. This year the plan for its carriages has been reduced substantially. This will free a part of the fleet, which we shall shift to transporting freight on the small [minor] rivers. In addition, the shipping company has assigned four motor ships to the port for delivering freight to Belorusskiy Settlement...."

All winter the river transport workers actively prepared for the shipping season. Captain V. Guselnikov's crew was one of the first to finish repairing its motor ship. A collective headed by Yu. Zharov repaired a motor ship with good quality. L. Kokulov's brigade repaired two motor ships at one time. This is the second year in a row that it has readied two ships for the shipping season. And this has its advantages, L. Kokulov believes. Out of two crews, a single brigade is created, into which go the most qualified specialists, who make up specialized teams. The main thing is that the people are interested in repair of good quality, inasmuch as they are to sail on these motor ships in the summer.

The port personnel might be able to work more productively. P. Savelyev, deputy chief for port operation, told us that the enterprise's capacity is not being utilized in full measure. Whereas a most strenuous time comes in summer, in winter the equipment, including nineteen 10- and 20-metric-ton portal cranes, essentially stands idle. Meanwhile, railroad cars are delayed in unloading at Nizhnevartovsk-1 Railroad Station. Oil workers haul most of their contents from the station to the river port on trucks in order that these may be delivered to the oil fields by water in the summer. Construction of spur tracks to the oil workers' industrial zone, the housing construction combine, and the air detachment's base is planned within the Nizhnevartovsk railroad system in accordance with the Sverdlovsk Railroad's general development plan. Here, in the second increment to the DSK [housing construction combine], the creation of Stroitel'naya [Construction] Station is planned, with classification [marshaling] tracks from which an 8-kilometer branch will extend to the river port. The matter of this branch already has been discussed twice in the USSR Gosplan [State Planning Committee]. The Ministry of Railways and the Ministry of the Petroleum Industry have been directed to carry out the plan and bring about the laying of the railroad track. Planning documentation exists, and everyone's interest is obvious, but one gets the impression that they are waiting in this matter to see who will take upon himself the responsibility for beginning construction.

These days the shipping season is opening on the Ob River. The Nizhnevartovsk people have met it in full readiness. They support the Gorkiy people's initiative: to work without laggards, with complete devotion of strength and knowledge.

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